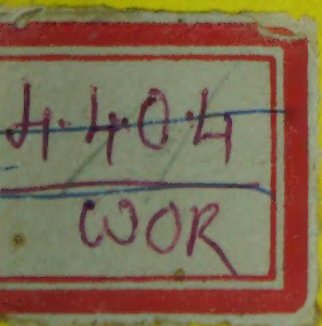


Population Planning

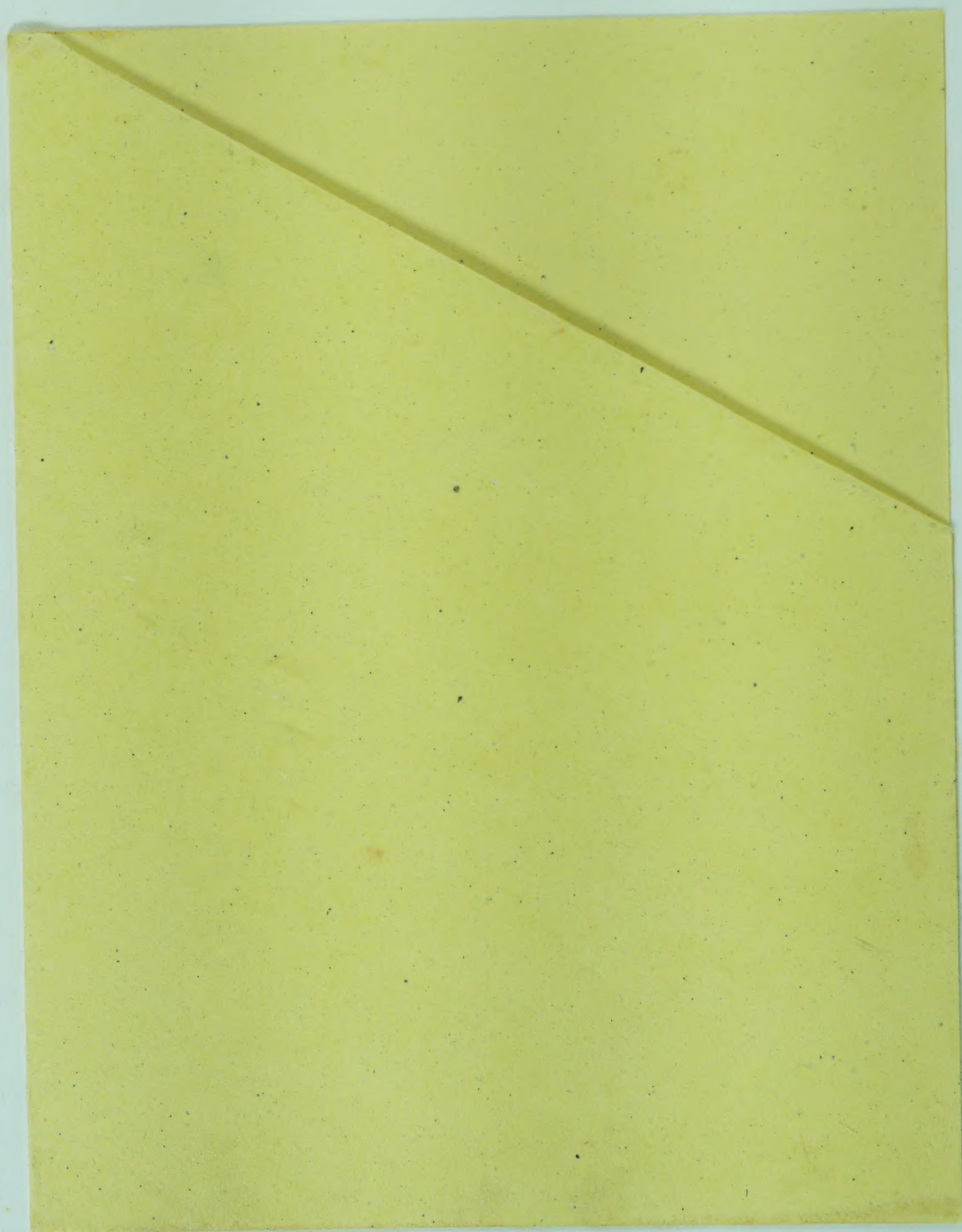
**Sector
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WORLD BANK

March 1972



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FOREWORD THE CELL

This is one of a series of World Bank pamphlets dealing with those sectors (e.g., education, agriculture, power, transportation, population, etc.) to which the Bank directs its development lending. Initially, these Sector Working Papers were not written with any thought of publication. They began as an internal exercise to gain better perspective on the characteristics of the fields of activity covered by the Bank's projects and to describe the size and philosophy of the Bank's lending program in each field.

The original instructions were to prepare papers that would describe the distinctive economic, financial, and institutional characteristics of each sector; outline the role played by each sector in the general process of economic development; review the scale and approach of World Bank operations in the sector; and summarize the Bank's philosophy about how its own operations, together with the activities of other aid donors, can contribute to building up each sector—physically, financially, and institutionally—in its member countries.

Although Bank loans are usually for specific projects (e.g., a dam, a group of schools, a power system) we are convinced that their merits can be judged only within a broad assessment of their relation to the development of the sector and of the whole economy. The fixing of priorities among individual projects, and the reform of policies and institutions to best serve a country's development needs, require that individual projects be considered in this wider context. Thus Bank projects are derived from an analysis of the larger economic systems into which they must fit. In conducting this "systems analysis" as a foundation for its project lending, the Bank places primary reliance on field-based country economic studies and sector surveys.

The Sector Working Papers have served a useful function at all levels within the Bank; we now feel they may be of similar interest to people beyond our own staff and management. They are therefore being published in a series of pamphlets that deal with the individual sectors in which the Bank is operating.

Robert S. McNamara
President, World Bank Group

March 1972

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POPULATION PLANNING

SECTOR WORKING PAPER

● This paper describes the Bank's efforts to help member countries reduce population growth rates and sets out its future program of activity in the field, as now envisaged.

To give perspective to this discussion, the paper also outlines the economic effects of reducing population growth in developing countries and summarizes available information on the global demographic situation, world population trends and projections, and the accomplishments and potential of family planning programs.

References to the Bank or the World Bank Group include the International Development Association (IDA) but not, for purposes of this paper, the International Finance Corporation (IFC). Money amounts are expressed in U.S. dollar equivalents. The Bank's fiscal year ends June 30.

INTRODUCTION

The purpose of economic development is to make possible higher living standards for individual men, women and children. A rising standard of living means a growing ability to afford both the material and non-material benefits which a modernized economy makes possible. For most people in most countries, however, the first requirements are more and better food, improved access to education and health care, and more opportunity for gainful employment.

Despite its limitations, one of the best available measures of economic progress toward these goals is the growth of per capita income. This is the growth of national income, adjusted for growth of population. Thus the relationship between the growth of a nation's income and that of its population is fundamental to the improvement of human welfare.

While neither the causes nor the effects in this relationship are fully understood, one central fact is clear: the higher the rate of population growth, the more difficult it is to raise per capita income. Today the world's population is growing much faster than at any time in history. This simple fact led the Pearson Commission to say, in 1969, that "No other phenomenon casts a darker shadow over the prospects for international development than the staggering growth of population."

The problems created by the large numbers and high growth rates of population concern both the world as a whole and individual countries. Both more and less developed countries confront such universal questions as the ultimate size of population the world can sustain and the rate at which the limit will be approached. The earth can undoubtedly support substantially more than the 3.6 billion people now living on it. But there is great doubt about its ability to sustain unlimited numbers at decent standards of living, which a majority do not have even now.

- The World Bank's concern, however, is not with ultimate numbers, but with the developmental impact of population growth. Development does not mean more people, but higher living standards and greater welfare for however many there may be. The Bank entered the field chiefly because it became convinced that the attempt to raise living standards in a great many developing countries was being seriously undermined if not thwarted. The Bank has no fixed ideas as to how large the population of individual countries ought to be. But it is convinced that in the great majority of developing countries, the faster the rate of population growth, the slower will be the improvement of living standards. Within the last few years, the governments of more than 26 countries have indicated that they share this belief by adopting official policies to slow their population growth.

There is another important reason for the Bank's entry into the population field. It concerns human welfare, and particularly health. There is strong evidence that where children have been well spaced, both they and their mothers enjoy better health and experience lower mortality rates. It does not follow, of course, that parents will necessarily choose to space their children or to have fewer of them, if given the chance to do so.

Many governments feel, however, that people should be given the choice if it is possible to bring it to them, and the Bank is prepared to help them do so. Experience suggests that if couples are given this voluntary choice their own family-size decisions will tend to slow the rate of population growth. Yet no one can predict whether the general response will develop strongly or quickly enough to give governments substantial help in attaining their development objectives.

The Demographic Situation

It took more than 1,800 years for the world's population to increase from 210 million to one billion. The second billion required about a century and a quarter, and the third only 30 years. It is now taking only 15 years to add the fourth billion (see Table 1). If present growth rates

Table 1: World Population Trends, Zero A.D. to 1970**A. Population Size⁽¹⁾ (millions)**

Area	About 0 A.D.	About 1000	1750	1800	1850	1900	1950	1960	1970
World	210	284	750	960	1,240	1,650	2,518	2,995	3,632
Europe			120	155	195	293	392	425	462
Soviet Union	39	63	30	45	70	130	180	214	243
Asia	138	165	480	630	810	930	1,381	1,660	2,056
U.S. and Canada			1	6	26	81	166	199	228
Africa			100	100	100	150	222	278	344
Latin America	33	56	12	20	35	65	163	213	283
Oceania			2	2	2	2	13	16	19

⁽¹⁾Totals may not check, due to rounding.

B. Average Annual Rates of Growth (%)

Area	1750-1800	1800-1850	1850-1900	1900-1960	1960-1970
World	0.5	0.5	0.6	1.0	1.9
Europe	0.5	0.5	0.8	0.6	0.9
U.S. and Canada	—	3.0 ⁽¹⁾	2.3 ⁽¹⁾	1.5	1.4
Soviet Union	0.8	0.9	1.2	0.8	1.4
Asia	0.5	0.5	0.3	1.0	2.5
Africa	0	0	0.8	1.0	2.4
Latin America	1.0	1.1	1.2	2.0	2.9
Oceania	0	0	0	1.6	2.0

⁽¹⁾Includes a high rate of adult immigration.

Sources: UN World Population Conference, Vol. II, pp. 21-22; and Population Council, Reports on Population/Family Planning, December 1969.

were to continue, the current population of more than 3.6 billion would double in 35 years, and by the end of this century it would be increasing at the rate of a billion about every eight years.

It is becoming increasingly difficult to raise living standards and maintain even the present quality of life in the face of these huge annual increases in population. This is especially true in the developing countries, where two thirds of the world's population live and where five sixths of the 1970-80 increase will occur. Such increases impose heavy economic and social burdens.

In the mid-1960s, about two thirds of total annual investment in a sample of 22 developing countries was required to maintain per capita income at a constant level, leaving only about a third to raise living standards. The corresponding figures for a representative sample of 19 developed countries were one quarter and three quarters. It is clear that present rates of population growth in developing countries are penalizing the hundreds of millions who live on the margin of subsistence. If developing countries are to achieve sustained social and economic development, population growth must be reduced.

The high rates of population growth in most developing countries result from their traditional high birth rates and declining mortality rates. Improved health services and medical technology will cause further mortality declines, which will require fertility rates to be reduced from present levels simply to avoid further increases in population growth rates.

The evolution of populations through the three stages of (1) high fertility/high mortality, (2) high fertility/low mortality, and (3) low fertility/low mortality is what demographers refer to as the historical demographic transition. Both the first and last are periods of modest population growth; the middle stage is one of rapid growth. It is in this middle stage that the world as a whole now finds itself, because the total rate of growth is heavily influenced by what is happening in the less developed countries where two thirds of the world's population live.

The demographic transition describes what happened historically in the now-developed countries. The causes of fertility declines that carry countries into stage three are complex and not yet fully understood. They include such influences as increases in the age of marriage, urbanization, the gradual spread of education, reduced infant mortality, the high living standards that accompany rising incomes, the spread of old age pension systems, the prohibition of child labor, and rising equality for women.

There is no guarantee that the same set of forces affecting decisions on family size will emerge with equal force in today's developing countries and lead them inevitably into stage three. They have not done so to date. Eventually they may, although no one knows how long it might take. The provision of family planning services can do much to speed up, perhaps by many decades, a transition that otherwise might occur only very slowly. The difference in the pace of this change might make the difference between development and non-development.

It is important to note that the Bank's interest in "population" is wider than family planning, which is directed at the spacing of children and limiting fertility. The Bank's concern also embraces many other aspects of population and its effects on development. Its periodic analyses of the development prospects of member countries normally include the main demographic variables of births, deaths, and migration. Population issues are central to the Bank's long standing interests in education, employment, and rural development.

These other aspects of the population question lie outside the scope of this paper, which is concerned only with the problem of limiting fertility and with the Bank's contribution to that objective.

However, enabling and persuading man to limit his fertility is itself a much broader problem than the provision of family planning services.

WORLD POPULATION TRENDS

In the pre-industrial era, world population grew slowly. Disease, famine and breakdowns in the social order resulted in mortality rates which were normally high, and occasionally very high. Epidemics sometimes wiped out large proportions of a population in a few years. For example, in the two years 1348-50, bubonic plague (the Black Death) reduced the population of Europe by 25%. Under these conditions, fertility had to be consistently high to ensure the survival of families and of the population. Societies whose cultural, religious and legal codes did not place a high value on fertility would not have survived.

The Demographic Transition

Population growth rates in Europe began to increase during the late eighteenth century. This was the result of a decline in mortality which accompanied the agricultural and industrial revolutions, but which was not matched for many years by any corresponding decline in fertility. Before the decline, death rates were around 28 to 32 per thousand. By the mid-1800s, death rates in England and Scandinavia were about 10 points lower than they had been a century earlier. The decline spread over most of the continent, and the rate continued to fall until in Europe today it is about 10 per thousand. Thus in many European countries the transition to present death rates took more than 100 years; the transition occurred more quickly in countries where it started later.¹

Three factors are considered basic to the historical decline in mortality rates: improved nutrition as a result of higher agricultural and industrial productivity; better sanitation and personal hygiene, which reduced parasitic and infectious diseases, particularly water-borne diseases; and improvements in medical care. As a result of the differential trends in mortality and fertility, the long term growth rate of Europe's population doubled, from about .5% to 1%.

¹One of the more dramatic cases of a rapid fall in fertility occurred in Japan after World War II. Both birth and death rates rose between 1875 and 1920; thereafter the birth rate fluctuated at the intermediate levels of 26-36 per thousand, standing at 33 in 1949. The death rate, on the other hand, fell to about 12 in 1949, giving Japan a rate of natural increase of more than 2%. Between 1948 and 1952, abortion on medical or social grounds was legalized and contraception encouraged by the passage of new legislation. During the subsequent 20 years the birth rate fell 15 points to 18, and the death rate continued its drop to about seven per thousand in 1969, giving a rate of natural increase just over one percent.

In most European countries a decline in fertility did not begin until the second half of the nineteenth century. It has continued, with minor interruptions, until the present. In the mid-1700s European birth rates were high (35-40 per thousand in most countries), but not as high as in many of today's developing countries (often 40-50). The sharpest declines in fertility occurred between 1870 and 1930, when they leveled out at around 20, and most European countries today have rates between 15 and 20.

The motivation for reduced fertility appears to have arisen from the spread of education, the progress of urbanization, and a realization that reduced death rates would lead to larger families unless fertility were checked.

Population Trends in Developing Countries

Prior to World War II, the developing countries also were characterized by high birth and death rates, and thus had low rates of natural increase. The demographic transition began with a rapid post-war decline in death rates unaccompanied by a corresponding decline in birth rates. Growth rates began to increase. Today, the average is 2.8%, with the level in some countries as high as 3% and even 4%.

There are wide variations, of course, and different developing countries are at different points along the path of the demographic transition (see Table 2). In some, both fertility and mortality remain high.

**Table 2: Population Distribution in Developing Countries
by Fertility and Mortality Levels, 1970**

Stages	Deaths per 1000 Population	Births per 1000 Population	Population					
			Africa ⁽¹⁾		Asia ⁽²⁾		Latin America	
			Number	Percent	Number	Percent	Number	Percent
1 (a)	High (over 25)	High (over 25)	27.0	8.0	17.0	1.4	—	—
(b)	Falling (15-25)	High (over 40)	307.0	90.1	978.5	82.6	24.0	8.4
2 (a)	Low (less than 15)	High (over 40)	5.0	1.5	76.0	6.5	112.5	39.9
(b)	Low (less than 15)	Falling	1.5	0.4	112.0	9.5	145.5	51.7
Totals			340.5	100.0	1,183.5	100.0	282.0	100.0

Note: Population figures are approximations. For purposes of this table, they have been rounded to the nearest 500 thousand.

⁽¹⁾Excluding five African countries with a total population of 42.4 million.

⁽²⁾Excluding People's Republic of China and four other countries with populations totaling 26.1 million, due to incomplete data.

Sources of basic data: United Nations, *Population and Vital Statistics Report*, January 1971; *Monthly Bulletin of Statistics*, August 1971; and Population Reference Bureau, *1970 World Population Data Sheet*.

In others, mostly in Asia and Africa, fertility is high and the death rate is falling. In still others, notably in countries with two fifths of Latin America's population, fertility is high and death rates are already low. In a few countries of temperate South America, East Asia and parts of Oceania, death rates are low and fertility is declining.

The postwar demographic experience has differed from the earlier experience of developed countries in several important respects:

- The decline in mortality has been much more rapid, occurring over one or two decades. For example, between the five-year periods 1945-50 and 1955-60, life expectancy at birth increased in India from 32 to 45 years, in the Republic of China from 41 to 61 years, and in tropical South America from 44 to about 52 years. Consequently, growth rates in the developing countries today are higher than were ever reached in Europe.

The difference is not merely in degree, but in kind. A European country with an annual rate of growth of 1% would double its population in 70 years; the average developing country with a growth rate of 2.5% will double its population in 28 years. If a 1% rate of growth were reduced to .5%, the doubling time would be extended by another 70 years to a total of 140. But an identical reduction of half of one percentage point when the growth rate is 2.5% would extend the doubling time by only seven years—a tenfold difference.

- Many of today's developing countries lack the open spaces and wealth of natural resources which characterized the areas of European settlement and enabled them to support high rates of population growth more easily.

- To some extent, the earlier growth in today's developed countries was attributable to adult immigration, leading to significant differences between their age structure during development and that of today's developing countries. By 1900, for example, only about 44% of the population of the United States and Canada was below the age of 20, while in developing countries today that age group commonly accounts for 50-55%.

- When mortality began to decline in many of today's developing countries, the levels of economic and social development were not comparable to those prevailing in Western Europe before the industrial revolution.

- The postwar decline in mortality has been occurring in many societies in which non-traditional economic practices and social attitudes, which normally accompany development, have not yet taken root. Unlike the reduction of fertility, a decline in mortality encounters no cultural and ideological opposition and does not require a large measure of continuous and active participation by the popu-

lation. In the earlier experience of today's developed countries, however, the technological means for similarly rapid reduction of mortality did not exist.

Thus, the current demographic situation in the developing countries does not have historical precedents from which they might take comfort. The considerably more rapid decline in mortality has created a greater imbalance than ever existed in the developed countries. This is the heart of "the population problem" in today's developing countries.

The solution depends on how fast and by how much fertility will decline in the next 20 to 30 years. The objective of population programs is to bring about declines in fertility more rapidly than would otherwise occur, primarily by supplying information and services to those willing to use them. To the extent that additional government policies and activities can influence voluntary fertility decisions, they too deserve to be considered as part of a country's population strategy. Much more needs to be learned, however, about both the effects and the efficacy of other instruments.

WORLD POPULATION PROJECTIONS

Table 3 suggests a range of possibilities over the next 30 years for the population of the world, the developing countries collectively, and a number of large developing countries individually. These are based on alternative projections showing what is likely to happen under optimistic assumptions (Projection A) and very slowly changing conditions (Projection B).

Projection A illustrates a type of population growth which could develop over the next 30 years if maximum efforts were made to develop family planning programs and take any other reasonable measures that might be effective in curbing fertility. On the basis of results achieved in the most successful programs to date, a "net reproduction rate" (NRR) of 1.0 could be expected by the year 2000.¹ This is a possible but unlikely achievement.

Projection B can be conceived of as an illustration of population growth trends if family planning efforts remain as modest as they are at present. Even under these slowly changing conditions, some decline in fertility can be expected because of family planning and some

¹The net reproduction rate is a measure of population replacement, in terms of the number of girl children born over the reproductive life of a hypothetical age group of women, after allowance for mortality. A population will not stop growing when the NRR of 1.0 is reached. It will maintain momentum for two or three generations, depending mainly on its age structure. Usually there is a relatively higher proportion of women in the child bearing ages than would be required for a stationary (non-growing) population. Therefore, even with a sustained NRR of 1.0 these populations would continue to grow for about 60 to 70 years until their age structure became stationary.

improvement in socio-economic conditions. In this case a NRR of 1.0 would be reached by about 2040.

These alternative projections, discussed in detail in Annex I, have the following major implications:

(a) **Population size and distribution.** World population, which totaled more than 3.6 billion in 1970, would reach 5.9 billion under projection A and 6.7 billion under projection B by the year 2000, a difference of about 770 million. Under projection A, world population would level off during the last quarter of the next century after having reached 8.4 billion. Under projection B, population would become stationary half a century later, at about 15.3 billion, or 7.4 billion more than under projection A.

The figures for developing countries alone are not very different. These countries would increase their population from 2.5 billion in 1970 to 4.5 billion in the year 2000 under projection A and to 5.3 billion under projection B. The difference is in the neighborhood of 800 million. The ultimate levels for today's developing countries would be about 6.7 billion people under projection A and twice as many, or 13.4 billion, under projection B.

(b) **The key role of large countries.** What happens to world population will depend very much on fertility trends in a few large developing countries. Comparing projections A and B for developing countries, half the difference in population size is accounted for by 12 of them: seven in Asia (India, Iran, Malaysia, Pakistan, the Philippines, Thailand and Turkey), two in Africa (Kenya and Egypt), and three in Latin America (Brazil, Colombia and Mexico).¹ This suggests the importance of giving priority to efforts to reduce fertility in countries where maximum impact can be achieved.

(c) **Fertility trends and births to be averted.** If projection A were achieved, the birth rate would be 7.1 per thousand lower in 1995-2000 than under projection B (21.1 instead of 28.2). For developing countries, the difference would be 9.3 per thousand (23.7 instead of 32). To achieve projection A rather than projection B, it would be necessary to avert about 840 million more births between 1970 and the year 2000 in the developing countries than projection B assumes; almost half of these would have to be in the 12 countries listed above.

While present programs give little promise of achieving a NRR of 1.0 by the year 2000, a substantially increased effort now should bring this goal within reach by about 2025. To reach a NRR of 1.0 by the year 2000 would require a maximum effort, something it is probably not realistic to expect.

¹Two large countries, Indonesia and Nigeria, are omitted from this list due to lack of sufficient data.

Table 3: Alternative Population Projections,⁽¹⁾ Birth Rates, and Births Omitted

Regions and Countries	Proje- ction	Population (in millions)			Birth Rate (Per 1,000 Population)			Additional Births Omitted 1970-2000 (in millions)
		1970	2000	c. 2075 A c. 2125 B	1965-70	1995- 2000	2020-25	
World Total	A	3,652	5,916	8,348	34.0	21.1	16.3	882
	B	3,652	6,690	15,306	34.0	28.2	23.1	
Developed	A	1,122	1,388	1,622	18.8	15.8	14.0	45
	B	1,122	1,431	1,931	18.8	17.4	15.6	
Developing	A	2,530	4,528	6,727	41.8	23.7	17.2	837
	B	2,530	5,259	13,374	41.8	33.0	24.6	
Asia								
India	A	536	948	1,402	41.4	23.6	17.1	174
	B	536	1,100	2,799	41.4	32.9	24.6	
Iran	A	28	56	88	45.0	24.3	17.2	13
	B	28	68	213	45.0	36.5	26.8	
Malaysia ⁽²⁾	A	9	18	27	36.0	21.2	16.1	4
	B	9	21	54	36.0	30.1	22.8	
Pakistan	A	126	260	408	42.3	24.2	17.0	62
	B	126	316	982	42.3	36.4	26.6	
Philippines	A	38	79	122	45.2	24.1	17.3	18
	B	38	95	282	45.2	35.9	26.2	
Thailand	A	37	72	108	41.1	22.4	16.7	15
	B	37	86	234	41.1	33.1	24.7	
Turkey	A	34	62	91	36.0	22.0	16.5	10
	B	34	71	173	36.0	30.6	23.2	
Africa								
Egypt	A	33	62	94	44.5	24.0	17.1	13
	B	33	74	205	44.5	34.8	25.6	
Ghana	A	9	17	25	49.2	25.6	18.0	4
	B	9	20	58	49.2	37.7	27.4	
Kenya	A	11	21	31	49.6	25.1	17.6	5
	B	11	25	70	49.6	36.7	26.5	
Tunisia	A	5	10	15	45.3	24.0	17.4	2
	B	5	12	34	45.3	35.8	26.1	
Latin America								
Brazil	A	94	181	273	38.6	22.1	16.5	31
	B	94	209	529	38.6	31.1	23.5	
Colombia	A	21	41	62	38.0	22.1	16.6	8
	B	21	48	120	38.0	31.3	23.6	
Mexico	A	51	109	172	44.6	23.7	17.0	27
	B	51	131	397	44.6	35.7	26.1	

⁽¹⁾For Projection A, a linear decline in gross reproduction rate (GRR) is assumed to a level which corresponds to a net reproduction rate (NRR) = 1 by the years 2000-2005; this decline is equated with maximum effective fertility control. Projection B represents population trends under the assumption that the GRR will decline linearly to make NRR = 1 in the year 2045; this situation is considered likely to occur if efforts for fertility control continue at the present levels. Both projections assume the same mortality which is supposed to have different declines in the future, for different countries. The full explanation of the assumptions is found in Frejka's introduction to his projections.

⁽²⁾Excluding Sabah and Sarawak.

Source: The table is computed on the basis of data from Tomas Frejka (Population Council), in "Alternatives of World Population Growth," a monograph in process of publication.

ECONOMIC EFFECTS

Relative Growth Rates of Population and Income

Rapid population growth is a comparatively recent phenomenon. It has accompanied economic development, and it is clear that the possibility for more people to live longer and fuller lives has been one of development's more important results. Past history, however, is a misleading guide to action, because the present situation does not offer a comparable possibility. As noted above, new forces are producing unprecedentedly high rates of population growth, while special circumstances which gave peculiar impetus to economic growth in the earlier period do not prevail.

There is no reason to believe that current rates of growth will fall fast enough to relieve the pressures on developing countries arising from the need to use significant and rising proportions of their resources simply to maintain the average standard of living of growing numbers, leaving less for further improvement. It is not that countries cannot have both growing per capita incomes and growing populations; the growth record of many developing countries in the last two decades shows that this is not impossible. What is at issue is the maintenance of per capita income growth at acceptable levels over longer periods, when the population may be doubling every two to three decades.

The decline of mortality in most developing countries has resulted in the survival of more adults, who would otherwise have had a shorter life span, and an increase in the number of surviving infants. The respective contributions of these two groups to the postwar population increase cannot be accurately calculated, but probably they are about equally significant.

The economic impact of their survival is quite different, however; more adults living longer increase the potential labor force and create an immediate demand for jobs and supporting services. They also add to the numbers in the reproductive age group, with a potential impact upon fertility. More children surviving mean a rise in the dependency burden and, at a later stage, a further relative increase in the reproductive age groups. Thus while any fall in the infant mortality rate is to be welcomed on humanitarian grounds, it adds burdens to weak economies which can be lessened only by reducing fertility. To do so, and thus lessen the dependency burden, leads to large economic benefits. This is the heart of the economic case in favor of programs to limit fertility.

The other component in high population growth rates has been the continued high level of fertility. In the longer run this can be

expected to decline everywhere. However, cultural and social factors are significant enough to make for important differences in fertility levels among areas of the world. In the face of continuing success in reducing mortality, no developing country has yet experienced a fertility decline sufficient to reduce the rate of population growth to the average level of 1% per annum characteristic of the developed economies of Europe, North America and Japan.

Falling fertility is the only factor that can accomplish such a reduction—except, of course, a return to much higher mortality rates. The issue is not whether the reduction will take place, but how soon, by what means and at what cost. The question is whether it can be initiated and accelerated through appropriate policy actions, in order to reap more quickly the economic benefits that can be linked with lower rates of growth.

Effect on Per Capita Incomes

The most certain, immediate, and measurable benefit of slowing population growth is the increase in per capita income. The immediate impact of falling fertility is a decline in average family size, reflected throughout society in a smaller dependency ratio.¹ In the short run there is no change in the labor force or other resources, so that the same national income will be available to a smaller number of people. At the same time, proportionately less of the national income will have to be used to maintain the capital stock per person at a constant level, making it possible to apply more resources to increasing capital per worker, thus raising productivity and per capita income.

The higher per capita incomes permit higher savings which could finance higher levels of capital accumulation, both physical and human. This, in turn, leads to further increases in the national income. There is nothing automatic about such a process, however; it is made possible by falling fertility, but the possibilities have to be seized and used for purposes which promote economic development. Such development may be accelerated as much by the investment in human resources—notably improvements in the quality of education—as by other kinds of capital improvements.

The effects of the decline in fertility will be felt in the labor market, which will have fewer entrants approximately 15 to 20 years later. The impact of this decline upon the national income will depend

¹The ratio of people not in the labor force to the total population. Since all persons depend on the production of those in the labor force, a lower ratio means that producers do not have to share their output with as many non-producers, yielding both producers and their dependents a higher per capita income.

mainly upon whether the opportunities made possible by lower population growth in the previous 15 years or so have been used to increase the quantity and quality of the capital stock. Many factors are involved, including labor productivity, the composition of the labor force, and improvements in health and education made possible by rising per capita incomes.

Employment and Income Distribution

Problems of unemployment and inequality in the distribution of income will always be eased by reductions in fertility. Continuing high fertility results in large numbers of young people entering the labor force each year. Employment opportunities have to expand fast enough to absorb them. At high rates of growth of population, where the numbers involved may be doubling every 25 years, the absorption problem is severe.

Any country with a problem of long run unemployment cannot fail to benefit from the slower growth in the labor force which results from reduced fertility. Where large numbers of people are entering the labor force to compete for jobs, wages are depressed, while those who own or control capital earn high returns, as do the owners of land and other resources in fixed supply. In any social or political system, high fertility tends to worsen the distribution of income and wealth. A reduction in the rate of growth of population makes it easier to redress these inequities.

Estimating the Effects

The longer term cumulative economic effects of lowering population growth rates are clearly profound, although it is difficult to isolate them from those of other economic forces. Since there is no basis for estimating such effects historically, attempts have been made to indicate their orders of magnitude by the construction of simulation models. With these models it is possible to work out the implications of varying fertility reductions over several decades, and to compare the results with the situation assuming no fertility decline.

While the quantitative results depend upon assumptions made about the economic relationships involved, they indicate substantial benefits in growth of per capita incomes, with a cumulative effect over time. Typically, if fertility is halved in a generation, by the end of that period per capita incomes can be 20% to 40% higher than if fertility had remained constant. The indicated benefits become more impressive as projections are extended into the future, but results in

the shorter period are more persuasive in terms of current policy.

This account of the economic benefits to be expected from a reduction in population growth rates places its main emphasis on the attainment of a higher per capita national income. The national income, however, has long been recognized as an incomplete measure of welfare, even in strictly economic terms. It needs to be supplemented by taking account of other benefits of reduced fertility.

Some of these appear as social benefits, but they have economic consequences which may themselves be measurable, at least in principle. They include an increase in the spacing between pregnancies, bringing benefits to the family in the form of improved health for mothers and children, fewer maternal deaths, and fewer retarded and handicapped infants. Improved nutrition and family care is more likely with smaller family size. A reduction in the number of illegal and unsafe abortions also follows as knowledge of contraception spreads.

It is possible to place many of the above conclusions in a cost-benefit framework, relating the value of the benefits to the costs of programs required to bring about reductions in fertility. There is as yet no fully agreed basis for estimating some of the key values to be employed, and even the use of this approach has aroused controversy. But there can be no question that the economic benefits of lower rates of population growth are considerable, and would prove to be all the greater if proper account could be taken of those which are not easily quantified. Calculations have consistently shown a level of benefits that exceed costs by a very wide margin.

Other Implications of Population Size

Much of the concern about current population growth stems from anxiety about its implication for the future size of population, whether in the world or in a particular country, in relation to the availability of natural resources. The growth of population, however, accounts for only about half the growing annual drain on the world's resources. The other half, or more, arises from the growth of per capita incomes.

Thus, except perhaps in the case of food, it is both rising levels of income and expanding populations that create pressures on the use of natural resources. These seem bound to intensify even if population growth slows down, despite man's ingenuity in overcoming technological problems with new agricultural methods, new sources of energy, new ways of combating pollution, and new, increasingly dense modes of urban living.

Even if many of the difficulties concerning the environment and

resource availability stem as much or more from income growth as from population growth, the wealthier a country is in per capita terms, the easier it will be to mobilize resources in order to cope with such problems. For example, an economy of 20 million people with an average income of \$2,000 might have the same problems of pollution or scarcity of resources as one of 400 million with a per capita income of \$100. There is little doubt that the smaller country could more easily tackle such problems, because of its greater taxing power and the more developed research and production capabilities that are associated with higher incomes.

Against the disadvantages of larger population size one potential advantage is sometimes mentioned: countries with large populations may be able to take advantage more readily of the economies of scale that undoubtedly exist in many activities, particularly in manufacturing. Market size, however, is more a question of aggregate income than of population size per se. There may historically have been countries which could have been considered under-populated, in terms of the economy's ability to make effective use of its natural resources. Perhaps the United States was in this position at some point in the past. However, instances when the addition of more people to the labor force led to increases in labor productivity and income per head must have been few in the past and are virtually nonexistent today. Developing economies will be able to increase per capita incomes more rapidly if their population growth is low than if it is high.

FAMILY PLANNING EFFORTS

While efforts to reduce population growth rates are still dwarfed by the magnitude of the problem, there has been a notable—even dramatic—increase over the last decade in both public and governmental interest, concern and action. In 1960, only three countries had official policies designed to slow the rate of population growth; by 1971, 26 countries, with more than two thirds of the population of developing areas, had announced such policies or started official programs; and some 24 others, with 12% of the developing world's population, supported private family planning programs without announcing official policies (see Table 4).

By 1970, 30 heads of governments, including those of 19 developing countries, had signed the U.N. Declaration on Population, which characterized "unplanned population growth" as one of the world's "great problems" and called on national governments to recognize family planning as one of their "vital interests."

Table 4: Official Positions of 48 Developing Countries on Family Planning

Population Size (Millions)	Policy and/or Program	Support but No Announced Policy
400 and more	People's Republic of China (1962) India (1952, reorganized in 1965)	
100-399	Indonesia (1968) Pakistan (1960, reorganized in 1965)	
25-99	Egypt (1965) Iran (1967) Republic of Korea (1961) Nigeria (1969) Philippines (1970) Thailand (1970) Turkey (1965)	
15-24	Morocco (1965)	Colombia South Africa
10-14	Republic of China (1968) Kenya (1966) Malaysia (1966) Nepal (1966)	Ceylon Tanzania Venezuela
Less than 10	Barbados (1967) Botswana (1971) Dominican Republic (1968) Ghana (1969) Jamaica (1966) Mauritius (1965) Puerto Rico (1970) Singapore (1965) Trinidad and Tobago (1967) Tunisia (1964)	Bolivia Chile Costa Rica Cuba Dahomey Ecuador El Salvador The Gambia Guatemala Haiti Honduras Hong Kong Nicaragua Panama Rhodesia Senegal Western Samoa

Source: Lapham, R. J. and Mauldin, W. P., "An Assessment of National Family Planning Programmes," unpublished paper presented to OECD's Fourth Annual Population Conference, October 1971.

Program Results

About 20 million women in 18 countries with programs, or 10% of the married women of reproductive age in those countries, have become "acceptors" during the last five years, the average period the programs have been in effect (see Table 5). It is important to distinguish between the total number of "acceptors" and the annual increase in that number (and to distinguish between the gross and the net increase, i.e., after allowing for those who cease their participation). The figure of 20 million acceptors overstates the number of women practicing contraception, because in every country many

acceptors leave the program and those who reenter are again recorded as "new acceptors."

Countries with population programs usually establish population goals, or targets. They may aim at reducing the existing crude birth rate to a specified lower rate over five to 10 years, or at recruiting specific numbers of acceptors into the program (sometimes even classified by methods) over a certain number of years.¹

An examination of these targets will show that a number of the programs which began five or more years ago, after declines in fertility for a few years, appear now to have reached an annual peak of acceptors; the number of new acceptors seems to have stabilized, while the decline of the birth rate appears to have slowed down or

¹See Annex 2 for population targets.

Table 5: Number of Acceptors by Method, and Coverage Achieved by Programs of 18 Countries (000s)

Country	Year	IUDs	Oral Contra- ceptives	Sterili- zation	Other Program Methods	All Program Methods	All Program Methods as a Percentage of Women 15-44 ⁽⁷⁾
Ceylon	1966-69	68	55	18	19	160	>8.2
Colombia	1965-70	209	97	u	11	316	u
Ghana	1969-70	5	3	0	3	11	1-2
Hong Kong ⁽¹⁾	1964-70	76	55	4	149	284	51.
India	1964-70 ⁽⁵⁾	3,799	0	8,659	2,098 ⁽⁶⁾	u	14.9
Indonesia	1968-70	88	59	0	28	175	u
Iran	1966-70	36	627	0	u	662	>9.3
Kenya	1969-70	49	24	u	u	u	2.
Korea, Rep. of	1964-70	1,713	597	150	u	u	42.
Malaysia ⁽²⁾	1967-70	3	196	9	12	220	8.
Morocco	1964-70	41	25	0	0	67	3.
Pakistan ⁽³⁾	1964-70	3,277	6	189	u	u	4.
Philippines ⁽⁴⁾	1970	84	193	—	85	362	u
Singapore	1965-69	10	82	4	51	147	35.
China, Rep. of	1964-70	779	150	1	u	979	44.
Thailand	1964-70	248	207	34	0	489	>9.6
Tunisia	1964-70	66	24	9	20	108	12.
Turkey	1965-70	250	32	0	0	282	u

Symbols: u, unknown; >, greater than total.

⁽¹⁾Non-sovereign territory.

⁽²⁾Excludes Sabah and Sarawak.

⁽³⁾Annual number of acceptors is an estimate based on units of contraceptives supplied, the assumed relationship being one acceptor equals 130 units per year. Because of the arbitrary bias of this estimate, the cumulation of acceptors is not considered warranted.

⁽⁴⁾Acceptors for years prior to 1970 when a population policy was announced represent clients attending clinics that currently participate in the government program.

⁽⁵⁾To March 31, 1971.

⁽⁶⁾Users of conventional contraceptives, based on figures of distribution.

⁽⁷⁾This column refers to current acceptors of all program methods as a percentage of women aged 15-44 as of January 1971 except for India, for which the date is January 1970.

Source: Population Council, *Population and Family Planning Programs: A Factbook*, No. 2 (1971 edition), June 1971, New York.

even to have been reversed. The long-established programs in the Republic of China, Hong Kong, Republic of Korea and Singapore are in this situation.

In a number of countries—India, Malaysia, Pakistan and Tunisia among others—programs have been in operation for five or more years and a substantial operational infrastructure has been built up; however, performance has been uneven and there has not yet been a significant or demonstrable impact on their fertility rates. But even in the case of the more successful programs, it is clear that more effective education and motivation efforts and more and better family planning services could increase significantly the proportion of women practicing family planning, with consequently lower fertility levels.

Other countries are just beginning their programs and the number of acceptors is still increasing. These newer programs include those in Ghana, Indonesia, Iran, Philippines and Thailand.

In addition, many countries are moving gradually from limited voluntary efforts in urban centers to a larger scale of services but without any national population policy, although government health facilities may offer family planning services. As their scale of activities expands, these countries can learn from the experience of others and develop not only their delivery systems for contraceptives but also their programs of information, education, and the evaluation of results. Such countries include many of the 34 which have pioneering private associations affiliated with the International Planned Parenthood Federation (IPPF).

One estimate of the number of births averted by family planning programs was made by the Development Center of the Organization for Economic Cooperation and Development (OECD) in 1970. It indicated that 2.3 million births had been averted in 1968. Compared with what is needed to bring down the rate of population growth to acceptable levels within a reasonable period, this is far from adequate. Approximately 4.8 million births would have to be averted annually between 1970 and 1975, and more than ten times that many, or 60.5 million annually, between 1995 and 2000 if the population of developing countries were to reach a net reproduction rate of 1.0 by the year 2000 (Annex 1, Table 6).

Constraints on Family Planning

There is considerable unevenness in the strength of commitments to population control in developing countries, ranging from mere pronouncements to firm policies and programs with varying degrees

of budgetary support. This may reflect in part some of the difficulties which have limited the effectiveness of many family planning programs.

Politically, there is sometimes concern that support of population programs may be a liability, especially since the results of any program will not be immediately demonstrable but unfavorable misconceptions may be widespread: a belief, for example, that there is a correlation between population size and military power; a fear that ethnic balances within a country will be upset; or a suspicion that the advocacy by rich countries of lower growth rates for the poor is merely a new form of colonialism and an excuse for not providing adequate development aid.

Cultural and religious objections to family planning are still serious, even in areas where national programs exist. In some countries a family planning program would imply a complete reversal of practice, tradition and mores. Furthermore, where infant mortality is high and children are needed for the family work force, high fertility is to be expected.

Various administrative and organizational difficulties commonly beset governments in launching new programs. These are often serious limitations. No matter how earnest the political commitment, a family planning program cannot be effective unless there is an organizational structure capable of bringing the available technology to those prepared to make use of it. Family planning programs are inherently difficult to administer, since they must maintain continuing contact with married couples over a long period.

The difficulty is increased when services must be carried to a widely dispersed, and often illiterate, rural population. Moreover, there is seldom enough trained personnel to carry out a program of the required magnitude. Finally, there is the handicap of limited administrative experience on the part of many persons in the medical and social service professions, who in most developing countries are responsible for administering family planning programs.

There are also important technological constraints. Although contraceptive technology has made considerable progress in the last 15 years, so far there is no perfect contraceptive: highly effective, safe, inexpensive, easily used and reversible, and one which would not necessarily have to be delivered under medical surveillance. Oral contraceptives and the intrauterine devices (IUDs) are likely to be the best available means of contraception for some time to come, although experience has demonstrated that both have their limitations.

While research is producing variations and refinements of both "the pill" and the IUD, any radically new technique of fertility control must

come from basic research in reproductive physiology, which is expensive, complex and uncertain. For the present, family planning programs will have to operate with essentially the same methods known today. Improvements are on the horizon, but radical breakthroughs toward the "ideal" are not expected soon (see Annex 3).

Family planning programs normally include education and information components, although the exact type of activities carried out must be carefully tailored to allow for cultural sensitivities and religious beliefs. Education consists of the preparation of curriculum materials on family life and sex and their introduction into school curricula after suitable testing and training of teachers. The target group is principally the next generation of potential acceptors.

Information, or communication, activities are directed mainly to the present generation of potential acceptors. These may be reached through various forms of mass communication (radio, cinema, newspapers, posters, etc.), as well as through face-to-face contacts established by health personnel, social workers, or specially trained field workers. The education and information components are vital parts of any well conceived family planning program.

A final constraint on effectiveness is inadequate evaluation. Although considerable work has been done on the measurement of results of family planning programs, there is everywhere a long way to go before adequate reporting systems exist to provide information for management decision-making and program evaluation. Inadequate evaluation machinery limits assessment of a program's effectiveness in reducing fertility, the ultimate test of its success.

An adequate information system for evaluation would address itself to three questions in particular: (a) The structure and level of demand, to provide guidance for determining the priorities of the program's efforts among areas and population groups; (b) The effect of varying the level and mix of various program inputs, to suggest the combination likely to achieve best results; and (c) The effect of the program on reducing fertility, to provide a measure of effectiveness.¹

Program Costs

Financial expenditures on family planning programs have been modest in relation to national budgets (averaging about 1%) and, as noted in the previous section, very low in relation to the economic benefits of reduced fertility. To date, external assistance has carried a sizable proportion of the costs, usually more than 30%. Tables 6 and 7 give data for selected countries. The relatively low costs are

¹See Annex 4 for discussion of a desirable management information and evaluation system.

partly explained by the use of existing health services as the main delivery system.

In many cases, even when a population policy exists, program expenditure is too little in relation to the need. Because national family planning efforts are so recent, cost trends are available for only a few countries; in some (e.g., India, Republic of China) expenditures are increasing; in others the data show decreases. Cost projections and the level of foreign assistance needed in the next decade cannot be assessed with confidence on the basis of such limited experience, but informed estimates have been made which suggest orders of magnitude.

**Table 6: Budgetary Position of Family Planning Programs
in Selected Countries, 1968-1969
(US\$ millions)**

Country	National Budget	Health ⁽¹⁾ Program	Family Planning Program	Foreign Aid for Family Planning	Foreign Aid as % of Family Planning Budget	Family Planning as % of Health	Family Planning as % of National Budget
China, Rep. of	823.0	64.4	0.6	0.5	87.1	1.0	0.1
India	3,141.9	70.8	49.3	18.9	38.3	41.1	1.6
Indonesia	646.3	n.a.	4.0 ⁽²⁾	n.a.	92.5	n.a.	0.1
Jamaica	218.3	18.5	0.5	0.2	31.7	2.9	0.3
Korea, Rep. of	984.8	7.7	4.1	2.0	48.8	52.8	0.4
Pakistan	996.6	46.0	19.1	14.9	77.9	41.5	1.9
Trinidad and Tobago	188.6	13.5	0.1	0.03	30.2	0.8	0.1

⁽¹⁾These data are not comparable on a country basis. Some countries do not show family planning costs independent of expenditures for health programs or do so to varying degrees. In some countries it is considered politically inadvisable to publish precise figures. Also, the data do not include the costs of private programs.

⁽²⁾Data for 1970-71.

In a staff study, the United Nations Fund for Population Activities (UNFPA) has estimated that it would be necessary for developing countries, if they were to carry out reasonably complete family planning programs on a broad national basis, to spend approximately 65 U.S. cents per capita per year. This figure increases to \$1 per capita if the costs of educational, motivational and system evaluation activities are included. These amounts are not small when translated into the proportions of national budgets they would represent, e.g., somewhere around 5%. Five percent is a much lower proportion than most governments normally spend on education (15% to 30%) or on national security, but it is about the proportion of total Ministry of Health expenditures in many low income countries.

Not even the most committed governments with the most successful programs are spending as much as half the per capita figures mentioned in the UNFPA study, and most are spending much less.

Table 7: Annual Per Capita Expenditure of Selected Family Planning Programs⁽¹⁾
(US cents)

China, Republic of	6.0	(1971)
India	7.72	(1968)
Indonesia	4.1	(1970)
Jamaica	37.0	(1968)
Korea, Republic of	10.4	(1969)
Pakistan	9.4	(1969)
Tunisia	16.8	(1969)

⁽¹⁾Based on funds from all sources—government, international, bilateral, and private.

Source: Population Council, *Population and Family Planning Programs: A Factbook*, No. 2 (1971 edition), June 1971, New York.

It is clear that population programs require important shifts in government priorities, which will frequently require fairly significant changes in budget allocations. Successful programs require substantial increases in both national and international inputs, public and private.

The Potential for Family Planning

How successful can family planning efforts be in reducing fertility over the next generation? No one knows. Not enough experience to serve as a guide has been accumulated in existing programs, most of which began only four or five years ago. Large areas of ignorance surround such key questions as the potential number of acceptors, since relatively little is known about the determinants of family size decisions and how open to change they may be among various social groups.

There is much debate among experts as to whether the present numbers of acceptors can be increased (a) primarily through the extension of services (an approach which assumes the existence of large numbers waiting to participate); (b) whether much more intensive information, communication and family life education activities would be more productive; or (c) whether much larger numbers of acceptors can be recruited only after basic socio-economic changes have taken place. Both research and further experience are needed to throw light on this fundamental question. Some inferences may be drawn, however, from recent experience:

- There does appear to be a correlation between a national program's supply capacity (i.e., the number of service facilities) and the number of women who make use of the program. This suggests that as a program's capacity is increased, it does gain additional acceptors, particularly in the early stages when those who can be most easily recruited are becoming acceptors. But there is also evidence that

programs in which insufficient attention is given to education and motivation do not succeed in recruiting anything like the proportion of women needed to reach national population goals. It seems clear that governments will have to give equal attention to both the supply and demand sides of the problem.

- Everywhere there are constraints to program expansion because of the already heavy demands on the medical services, inadequate numbers of trained personnel at all levels, inadequate and insufficient physical facilities, etc. But given the political will, such problems are not insurmountable over the long run (and, as indicated in the next section, these are areas in which the Bank can assist). Over the short run, there are possibilities for making use of non-medical personnel, in particular social workers, and using paramedical personnel more effectively in providing family planning services.

- As to long term demand for family planning services, three kinds of evidence suggest that it exists or can be developed:

- (1) Various knowledge, attitude, and practice (KAP) surveys indicate that most couples in developing countries want fewer children than they now have. The average number of children that a family “desires” is between four and 4.5, compared to actual family size of five to 5.7. In particular, many families which already have at least three children do not want more: in Hong Kong and seven developing countries,¹ 60% of respondents who already had three children and 70% of those with four said they did not want to increase their families (see Table 8).

These surveys have their limitations. For example, the replies of older respondents are influenced by their actual reproductive history. Moreover, an expressed preference for a given number of children does not necessarily mean that contraceptives will be used on the requisite sustained basis. Nevertheless, studies suggest that younger and better educated women want smaller families than their mothers did. If the evidence of the studies is accepted, it does appear that there is an unsatisfied demand for expanded family planning services.

- (2) The appallingly high incidence of illegal abortions in many countries, particularly in Latin America, clearly indicates an unmet need for family planning services.

- (3) The most successful family planning programs to date—in the Republic of China, Hong Kong, Republic of Korea and Singapore—have been conducted in countries where social pressures and the level of socio-economic development had already led to some decline in

¹Hong Kong 1967; Thailand 1965; Philippines (urban) 1969; Turkey 1963; Republic of Korea (urban) 1964; Tunisia 1964; India 1960-61; Indonesia 1963.

fertility. Preliminary results of the 1970-71 census in many countries of Asia and Latin America indicate a population size smaller, though admittedly to a minor degree, than had been projected by the United Nations. To the extent that the lower-than-expected population level indicates that a decline in fertility has begun in these countries, it may be an encouraging indication of the results that might be achieved by inaugurating or intensifying family planning programs there.

Table 8: Survey Findings on Actual and Desired Family Size
A. Average Desired Family Size and Percentage of Persons Reporting They Do not Want More Children, For Selected Countries

Area	Type of Sample	Average Number Children	Percent not wanting more children among those with		
			4	5	6
Ceylon	Rural	3.2	69	88	44
China, Rep. of	Urban	3.9	76	88	—
Ghana	Urban	5.5	—	—	—
India			75	85	37
Central India	Urban/Rural	3.8			
Mysore a	Urban	3.7			
b	Urban	4.1			
c	Rural	4.7			
d	Rural	4.6			
New Delhi		4.1			
Indonesia	Rural	4.3	37	41	19
Jamaica	Urban/Rural	3.4-4.2	80	84	—
Korea, Rep. of	Rural	4.3	—	—	—
Pakistan ⁽¹⁾	Urban	4.0			
East			57	54	45
West			68	71	41
Philippines	Urban/Rural	5.0	68	85	50
Thailand		3.8	86	96	70
Turkey	National Population	3.8	44	66	—

B. Completed Family Size by Region

Region	Completed Family Size ⁽²⁾
World Total⁽³⁾	4.7
Developing Regions⁽³⁾	5.5
Africa	6.1
Asia ⁽³⁾	5.5
Central and South America	5.7
Developed Regions	2.9
Europe	2.7
United States and Canada	3.7

(1)Before political events of 1971-72.

(2)Average number of children born per woman living through reproductive period.

(3)Excluding the Soviet Union and People’s Republic of China.

Source: Mauldin, W. Parker, “Fertility Studies: Knowledge, Attitude, and Practice” in *Studies in Family Planning*, Number 7, The Population Council, New York.

In the long run, fertility reduction can be achieved only with the right combination of social and economic development, cultural and political attitudes, and easy availability of contraceptive facilities. No one yet knows the required mix, which will probably differ from country to country. However, the limited experience available has already shown that if an adequate service can be provided, including public information and a variety of acceptable methods, the results will be demographically significant even if inadequate to achieve the desired reduction in fertility. The initiation of movement in the right direction also provides hope that more rapid progress will be possible as programs are extended and improved.

THE BANK'S PROGRAM AND APPROACH

Program Projections

Table 9 summarizes the Bank's actual and projected lending for population projects in the seven fiscal years 1970-76. It also shows the number of sector missions already mounted and contemplated.

**Table 9: Summary of World Bank Population Activities
By Fiscal Years, with Projection through FY1976**

	Actual			Program		
	1969	1970	1971	1972	1973	1972-76
Sector Missions	1	3	3	4	5	24
Commitments (\$ million)		2.0	8.0	29.0	30.0	150.0
% Total Bank and IDA		0.1	0.3	1.0	1.1	1.0
Number of Countries		1	2	3	4	19
Lending Operations (No.)		1	2	3	4	20
% Total Bank and IDA		0.8	1.6	1.9	2.2	2.0
Projects under Supervision ⁽¹⁾		1	3	6	10	14 ⁽²⁾

⁽¹⁾End of Fiscal Year.

⁽²⁾Annual average.

The number of projects, the number of countries involved and the volume of lending anticipated are all relatively minor when compared with the Bank Group's total operations. This should not, however, be taken to reflect the importance attached to the population sector by the Bank or by increasing numbers of its borrowers, nor do such projections serve as a full measure of the Bank's growing activity in this field.

As now envisaged, projects assisted by the Bank and IDA by the end of FY1976 will be in countries with about 70% of the population

of the Bank's developing members. Many of the projects will be considerably larger than the first few that have been financed while the Bank has built up its staff, gained experience in the field, established close working relations with governments, other international institutions and private organizations concerned with population questions, and mounted nearly a dozen missions to accumulate detailed knowledge of the sector in individual countries.

Beginning with FY1972, Bank Group operations will focus increasingly on the larger countries where a downward shift in fertility rates would be most significant. For planning purposes, it is assumed that roughly half the 20 projects foreseen over the period 1972-76 will involve commitments of between \$5 million and \$10 million, while half the remainder will be above and half below that range.

The Bank's strategy in the five year period will be to establish the usefulness of its project approach in dealing with the population problem, primarily through experience with about 25 family planning programs, including as many as possible in countries with large populations. At the time of drafting this paper, for example, projects in India and Indonesia were nearing the final stage of consideration, and a number of others involving major population groups were already well advanced.

The projections in Table 9 are based on an assessment of practical possibilities in specific countries, in the light of both government and popular attitudes prevailing in 1972. They are unlikely to be revised downward, but experience may well show them to be overly conservative. Attitudes toward population questions have already changed dramatically since the Bank entered the field three years ago, thanks chiefly to the pioneering work of a few governments and several leading private organizations. The momentum of change is increasing. As awareness of the problem spreads and the Bank's capacity to assist becomes better known, further acceleration of the five year program may become possible.

Fact Finding and Institution Building

Leaving that possibility aside, however, it should be emphasized that project numbers and amounts in money terms are a less accurate barometer of Bank involvement in the population field than are similar figures for most other sectors. This is because, in most cases, a lack of foreign exchange is not the principal constraint on effective implementation of population policies. Often, in fact, the greatest need and the Bank's most useful contribution is not finance, although this can be critically important, but technical assistance in any or all

of its many forms.

One of these is education, in the most strategic sense. In many countries, the general implications of population growth in terms of development may be known by the professional and political elite, but understanding may not be sufficiently widespread to support decisive policies or action. In these cases, the Bank can often help governments through its capability for fact-finding and analysis. It can do so effectively, of course, only at the Government's invitation or, at the least, with its acquiescence. Given one or the other, however, the Bank's help in collecting, organizing and analyzing facts about a country's demographic position and its meaning in terms of development can sometimes be crucial.

One medium for this is the Bank's regular economic reports on borrowing countries. As a matter of policy, each of these reports is now supposed to include an analysis of the country's demographic situation and of its population policies or program. Unfortunately, this policy objective has not yet been fully realized; in fact, demographic analysis was included in only half the country reports completed in calendar years 1969 and 1970. This situation can be expected to improve, however, steadily increasing the effectiveness of such reports in providing the basic facts governments need to identify their own population problems and generate the political will on which action must depend.

Far more detailed knowledge of the demographic situation and of population problems, policies and programs in specific countries is provided by the Bank's sector missions. Because of staff limitations and the shortage of qualified independent consultants in this field, the number of such missions will increase only gradually over time. They can be extremely valuable, however, both to the Bank itself and to the countries concerned.

As of January 1, 1972, population missions had been sent to Colombia, Egypt, India, Indonesia, Jamaica, Malaysia, Mauritius, Trinidad and Tobago, and Tunisia. Missions to Ghana and the Philippines were planned during the remainder of fiscal 1972. In addition, pre-investment studies in population planning have been completed for Iran, Kenya, Tanzania, and Uganda; hopefully, at least two of these will lead to projects in the near future.

Each of the three projects thus far financed by the Bank Group, in Jamaica, Tunisia, and Trinidad and Tobago, was preceded by a sector study. These three relatively small countries have given the Bank invaluable experience in a new sector. A fourth successful sector mission was one in 1969 to Indonesia, involving the United Nations, the World Health Organization (WHO) and the Bank. This mission's

work led to the Government's adoption of a five year plan and facilitated reorganization of the Government's Family Planning Board. In Mauritius, the work of a fifth sector mission led to an increase in the Government's financial support, and provided the basis for an integrated family planning maternal and child health program which was subsequently financed by UNFPA.

Proposals for a large scale pilot project in India, including a management information and evaluation system, have been accepted by the Government and will form the basis of a Bank project which has already been appraised. No project has emerged as a result of the mission to Colombia, since the Government does not feel able to accept a project justified solely in terms of family planning.

Results of some of these sector missions illustrate another facet of the Bank's technical assistance capability which may often be more important than external finance: help to governments in building the exceptional types of institutional structures which are required to plan and administer successful family planning programs.

This institution-building form of assistance involves a wide range of activities. It may include help in the organization and top-level staffing of national family planning agencies; the assessment of a program's manpower needs; the planning or provision of training for medical, social and demographic personnel; the design, collection and processing of service statistics; the evaluation of a program's performance; the design of research projects; the conduct of attitude surveys; the development of education materials for use in school systems, adult education activities or public information programs; the functional and economical design of buildings used in providing family planning services; the organization of recruitment activities; the procurement and distribution of contraceptive supplies; or other facets of planning, administration or training.

The Bank, of course, is not equipped with either the staff or the expertise required to provide assistance in all such areas directly. A number of these matters are the primary responsibility of other agencies in the United Nations system. In some specific fields, the principal reservoir of competence and experience may be found in other international institutions, bilateral agencies or private organizations. The Bank maintains close working relations with all these sources of expert assistance, and can often play an important coordinating and catalytic role, with or without financial involvement.

The relative emphasis to be placed on fact-finding and analysis, on the one hand, and institution building, on the other, will vary from country to country, depending upon the government's attitude toward population planning. The first role is likely to be dominant in

countries which are hospitable or permissive with respect to family planning activity but which have no official programs; institution building will play a larger role in countries which have adopted population policies or programs and which welcome the Bank's assistance.

As in other sectors, the Bank's lending for population projects will also be accompanied by help in building institutions and by other forms of technical assistance. One of the most basic of these is assistance in identifying those projects which command the highest priority and preparing them in sufficient detail for the Bank, IDA or other agencies to consider their financing. Many other aspects of technical assistance will be incorporated in the projects themselves, with their costs included in Bank loans or IDA credits.

Constraints

Government commitment to population planning is a prerequisite to Bank activity. In those of its member countries which have not yet recognized that a population problem exists or which have expressed opposition to family planning programs, and which accordingly do not seek the Bank's assistance, the Bank cannot expect to operate. It may seek to educate and persuade, but it cannot hope to develop projects. This constraint, very real where it exists, may nevertheless become less severe with time, since political support for population planning appears to be spreading while commitments already made are becoming stronger.

At present the lead time for project development is long, since the Bank does not possess the basic sector knowledge in most countries which allows projects to be identified rapidly. Every project is a "first," in a new country. The field itself is a new one so far as large scale government programs are concerned, and there is no firm body of experience to give clear leads as to what activities are needed and will be successful. When project proposals have been worked out, they frequently have a number of components that require preparation with several ministries and agencies which may have no experience of working together in the population field.

The large number of external agencies providing assistance in the field also presents a problem of coordination in each country as well as internationally, especially since some of the basic relationships among key agencies are still in the process of being sorted out. Finally, almost all governments are new in dealing with population problems; they too are inexperienced and uncertain about the kinds of projects they want and need and about what types and sources

of external assistance can help them most. For all these reasons, the number of Bank and IDA lending operations is bound to grow fairly slowly.

Population Projects

Population programs typically embrace much more than the provision of family planning services. In addition, they may include information and educational activities, research on the determinants of fertility and family-size decisions, adjustments in the social and welfare legislation affecting the age of marriage or the size of families, the improvement of vital statistics, and training in demography, nutrition and related activities. Nevertheless, the core of population projects is the provision of effective family planning services, including not only supply-oriented activities but also demand-oriented activities designed to motivate and recruit acceptors.

Family planning services are provided through a system that can be described in terms of the following nine components:

(a) **Program organization, management and administration:** i.e., designation of the responsible program agency and its location within government, the qualifications of key individuals, and the agency's internal organization and functioning.

(b) **Physical facilities:** buildings, equipment and vehicles used for dispensing services and for training, research, and program administration;

(c) **Staffing and training:** the medical, paramedical and other staff required and their training in family planning work;

(d) **Contraceptive methods and supplies:** the methods made available in the program and the existing arrangements for procuring and distributing necessary supplies;

(e) **The "delivery system":** the channels through which contraceptive methods are made available to acceptors. This will depend mainly on how the facilities and staff used for family planning are related to the regular health services, and the way the latter are organized. The use made of the private sector, including voluntary agencies, physicians, pharmacists and other retail distribution channels, is an important aspect of the delivery system;

(f) **Information, education and the recruitment of acceptors:** the kinds of public information and communication programs used to explain program objectives, plus the mechanisms relied on to establish contact with the target population (husbands and wives in the child-bearing years); also family life education built into school curricula.

(g) **Evaluation:** trends in activity levels as revealed by service statistics; demographic trends as revealed by census data and special research studies; bio-medical effects as revealed by special studies;

(h) **Finance:** program costs, including capital and operating expense, and arrangements for meeting them;

(i) **The program:** the action plan, or strategy, for expanding and improving family planning services.

While this is not an exhaustive list, it serves to identify those aspects of a program which the Bank examines when making a sector survey as background for project identification. Weaknesses or gaps in the set of activities outlined above, as found in a particular country, automatically suggest the contents of a project. They may also suggest steps the borrower will be asked to take before the Bank is prepared to finance a project.

Projects as well as programs normally include both tangible and intangible elements. The tangible—or “hardware”—elements usually account for the principal capital expenditure. These are items such as buildings, vehicles, furniture and equipment, office machines, training aids, printing equipment and machinery for contraceptive manufacture, etc.

Most “software” items also require additional expenditures. They may include training, the preparation of materials for schools and adult education, applied contraceptive research, attitude surveys, demographic research, foreign study fellowships, technical assistance services, or additional operating costs arising from program expansion.

Project components which may or may not require funds include necessary legal or organizational changes, the improvement of service statistics, the installation of improved accounts, revisions in arrangements for procuring contraceptive supplies, or the working out of an action plan for three or four years in the future.

The mix of project components in the Bank’s initial population projects has already shown considerable variety. The first three, in Jamaica, Tunisia, and Trinidad and Tabago, include a high construction component (about 80% of total project costs), although there are significant differences in the types of facilities financed in the three projects. The much larger Indonesia project consists of only 40% construction, the rest being distributed among advisory services, technical assistance, vehicle purchase, demographic research, training stipends, and incremental operating costs.

“Software” components of the first three projects are also widely varied, and there are considerable differences in the organizational and administrative changes agreed upon with the borrowers. In the proposed India project, an experimental nutrition component will

be introduced in order to test the relationship among nutrition, infant mortality and fertility.

Thus, while population projects consist of a certain number of identifiable "building blocks," the relative importance of each element can differ greatly from project to project. Furthermore, the importance of a particular component may bear little relation to the amount of money earmarked for it in the project cost table.

While facilities financed by the Bank for family planning purposes will frequently include buildings used for other health needs as well, their justification is solely in terms of their contribution to family planning objectives. In other words, the Bank does not currently finance health facilities per se.

Areas of Emphasis

Certain aspects of the problems of broadening the scope and improving the effectiveness of population programs demand special attention, and will be given greater emphasis in the Bank's work. These include:

- **Training.** The effective use of family planning facilities depends to a large extent on the quality of the training of personnel available to staff them. Most developing countries suffer from shortages of adequately trained personnel in the three most relevant fields: medical, paramedical and social service. Paramedical personnel play a key role in family planning through provision of services in clinics, in the field, and in maternity hospitals. In rural areas they are often the only persons with whom villagers come in contact; they are therefore a critical class of family planning workers. In addition, voluntary social workers can be trained and mobilized for field work.

Besides the local training needed for most operational workers, support frequently needs to be given for external training of personnel in the various disciplines at suitable overseas centers. Bank projects have provided for such training of selected personnel to strengthen the programs.

- **Physical Facilities.** Most developing countries have a substantial need for the development of physical infrastructure. This is true of health services and institutions for training, education and research. In the current stage of contraceptive technology, health facilities will continue to be the main vehicle for delivery of services and for the training of personnel involved in family planning. A large number of governments with population policies have committed themselves to provide family planning services only within the context of maternal and child health (MCH) services, for practical as well as political reasons. The successful programs in East Asia are in countries with

developed MCH services.

Thus the provision of physical facilities in population projects will often be designed to enable family planning services to be delivered within the existing framework of a government's health services. Recent studies have suggested a close relationship between declines in infant mortality and, with some time lag, declines in fertility. Some of the contraceptive methods now in use and others likely to become available in the future require the support of a health infrastructure. These facilities also provide an important base for postpartum motivation.

There will also be need to expand other types of physical facilities required for such functions as communication, information and education, the production of educational materials, and research on socio-economic and technical problems.

- **Communication Strategy.** More emphasis will be given to the stimulation of demand for family planning services, especially in the larger of the less developed countries. These include the provision to individuals of information about family planning, group motivation, and face-to-face communication, particularly through social workers. Some existing programs will need a review of their communication strategy, since present approaches, adequate to reach the most responsive acceptors, appear less effective in penetrating deeply.

Information may be provided through existing channels of communication, for example by incorporating family life education into the school curriculum. In addition, influential older people may need to be reached by incorporating family planning information in literary, handicraft, or community development programs.

In some countries, and especially for rural areas, it may be more effective to develop a program of home visitors—trusted local persons trained in social work and community development — who would work closely with local family planning and MCH centers, serving as a link between them and the community.

- **Commercial Sector and Private Groups.** Often the commercial sector and private groups have not been adequately utilized in government programs, though they have been in some and much can be learned from their experience. The utilization of these groups for delivery of contraceptives and for promotional work will be built into programs where opportunities exist.

- **Measures for Social Welfare.** There are indications that reductions in fertility and acceptance of the small family concept may be promoted by measures which have little or no relation to the direct provision of family planning services. These include steps to improve

the status of women and expand their opportunities for education and a wider choice of occupational and intellectual pursuits. Other examples are changes in the lawful age of marriage, in benefits provided by old age insurance, in the payment of children's benefits under insurance or welfare programs, and changes in allowances or exemptions for children provided by personal income tax law. Although research on these topics is now going on, the field is new and little firm guidance yet exists. The Bank will try to keep abreast of findings in the field and will use them as appropriate.

- **Reduction of Infant Mortality.** In assessing attitudes toward family planning, it is important to differentiate between women in the subsistence and monetary sectors of the economy. Among the former especially, a convincing reduction of infant mortality rates may be essential before the majority can be effectively motivated to practice family planning. The Bank intends to take full account of government policies and plans to achieve this result, for example through nutrition programs and the provision of maternal and child health services.

- **Research.** In virtually all areas involving population questions there is need to improve the state of knowledge by means of well conceived, well implemented research. It is the Bank's intention to promote research in areas where the need is most pressing.

Research in the population sector covers a wide variety of topics. These can, however, be classified into four main groups. There is first of all basic demographic research, aimed at improving the data base for the main variables—fertility, mortality and migration. Second, there is economic research into the implications of population trends and their interrelationships with other economic variables. Included in this group would be studies of the economic effects of population programs.

The third area is bio-medical research, involving contraceptive technology and reproductive biology, basic to the increase in knowledge required before improved contraceptives can be devised and tested. Finally, there is a variety of operations research topics, all of which are directed to questions in various disciplines involving population policies. These include, for example, research on management questions, evaluation procedures, the role of communications, and motivation and educational techniques. One subject that needs considerably more research in nearly all countries is the set of motivations that determines the fertility and family size objectives of dissimilar socio-economic groups.

In view of the nature of the Bank's involvement in the financing of family planning programs, its main interests in research are likely

to be those related to the operations of such programs. The methodological aspects of family planning programs, including, for example, cost-effectiveness and cost-benefit questions, or techniques of evaluation, are likely to be of particular concern to the Bank.

In addition, analysis of the wider relationships of population growth and movement to economic development requires support through appropriate research. In carrying out general economic analyses of the development prospects of member countries it is necessary to study the demographic aspects which form the underpinnings to economic planning.

Population research is usually best pursued in the country concerned, by domestic institutions which can draw upon well informed local research workers. The cross-disciplinary nature of the work requires skills and knowledge which normally go beyond the competence of the Bank. In these cases, such as biomedical research, the Bank is unlikely to be involved directly. It will maintain a continuing interest, however, and will encourage other appropriate national and international organizations to pursue such work.

In such areas as economic and operationally oriented studies, the Bank's involvement may be more direct. It might initiate research projects or encourage national institutions to carry out studies. It is also hoped that the Bank's own operations will yield material which can help to illuminate research undertaken by others.

Cooperation with Other Agencies

The Bank works with a number of other agencies operating in the family planning field (Annex 5). This cooperation has been both formal and informal. It is certain to increase, in depth and in scope.

The United Nations, WHO, UNFPA, the Pan American Health Organization (PAHO), the International Planned Parenthood Federation (IPPF), the International Development Research Centre of Canada, the Population Council and the Ford Foundation, as well as several academic institutions, have cooperated with the Bank in providing experts for missions.

The Bank itself has participated in missions with other institutions. The UN-WHO-Bank mission to Indonesia, which the Bank initiated, helped the Government establish its population policy and prepare its Five Year Plan. The UNFPA participated in a second mission to Indonesia. The Swedish International Development Authority (SIDA) sent an observer on an appraisal mission to India.

Cooperation with other agencies has extended beyond sector studies into the project implementation stage. In the Jamaica project, two studies bearing on the management aspects of the program were

financed by the U.S. Agency for International Development (U.S. AID). PAHO will provide some of the advisory services in the Trinidad and Tobago project. WHO may undertake some health studies related to the project in Tunisia. In Indonesia, the project will be jointly financed by UNFPA. SIDA may join in financing the Indian project.

Within the United Nations system, the major expertise in the population field is not with the Bank but is spread among a number of agencies: WHO for the medical aspects, the United Nations for demography, Unesco where education is concerned, etc. Accordingly, the Bank's work in this sector must be carried out in close cooperation with the other international agencies concerned, as well as with bilateral agencies, such as AID, SIDA, the Canadian International Development Agency (CIDA), and with private organizations such as the Population Council and IPPF.

Cooperation with the large number of development assistance organizations involved presents some difficulties, particularly in cases where basic approaches to the subject may be different. Moreover, there are many kinds and degrees of cooperation, ranging from projects formally organized as joint financing operations to informal arrangements for separate but complementary projects in the same country. Only after considerably more experience has been gained will it become clear precisely which patterns or sets of patterns of cooperation are likely to be most effective.

ANNEXES

POPULATION PROJECTIONS, 1970-2100

Future size of population in the various regions of the world will depend ultimately on the trend of fertility in the next 20 to 30 years. Other determinants are the present age and sex structure and the mortality schedule. As for mortality, after a further substantial decline in developing countries over the next decade or so, it may reasonably be assumed that the downward trend will level out, as it has in the developed countries.

For this analysis, a recently developed model¹ has been used to prepare illustrative projections for the entire world, the less developed countries (LDCs) considered as a whole, and for large countries and regions of Asia, Africa and Latin America. This model permits calculations and demonstrates the interaction, at five year intervals, of future population size, age structure, and several demographic indices and rates, such as the average annual growth rate, crude birth and death rates, total fertility rate (sum of age-specific fertility rates multiplied by interval length), expectation of life at birth, and gross and net reproduction rates.

The basic data for these projections are the age distribution of the population of a region or country in or around 1965 and the mortality and fertility levels of the late 1960s. Only one set of mortality assumptions, implying an orderly decline, is used for each region or country; in the calculations, a series of assumptions has been used, differing from each other by speed of fertility decline.

For the purpose of this illustration, two projections for each population under consideration have been selected. These are provided for the whole world, more developed regions, less developed regions, and for regions and countries selected on the basis of their absolute size and their present favorable disposition to measures of fertility control.

Projection A assumes that fertility will decline to a level corresponding to a net reproduction rate (NRR)² of unity by the period 2000-2005. For this decrease to be possible, an effort of "maximum effectiveness" is assumed.

Projection B represents population trends in the future if efforts to achieve NRR of 1 by the year 2000 are unsuccessful, and the level of replacement is not achieved until 40 years later (i.e., by 2040-2045).

The measure of the effort required to decrease fertility to NRR of 1 by the year 2000 is the result of comparing absolute numbers of births

¹Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

²For definition see footnote, page 10.

through the years, under assumptions A and B and applying the same mortality rates.

The arbitrary choice of NRR of 1 as a goal of fertility decline is based on the generally accepted view that populations will have to stop growing some time in the future. Fertility patterns corresponding to NRR of 1 lead eventually to stationary populations. A NRR greater than 1 results in compounded population growth. The consequences of continued growth for a long period are extremely large populations, difficult to conceive as functioning societies in terms of present standards.

Table 1 presents the results of projections A and B for the entire world and for the less developed regions to the year 2100. Other demographic indicators of the resulting populations at different dates between 1970 and 2100 are included in the table, as supplementary evidence to describe the consequences of rapid or slow fertility decline.

World population was estimated to be at a level of about 3,700 million in 1970. Projection A, which resulted from assuming that fertility would decline after 1970 and achieve NRR of 1 by 2000, indicates that the size of the population in that year would reach 5,900 million. This growth may be considered a minimum. It is a target which can be attained only if considerable effort is applied to changing present attitudes toward high fertility among peoples of less developed countries, where world population trends will be chiefly determined.

The contribution of the developed countries to population growth may be considered negligible. As a group, they had 30% of the world's population in 1970 and a net reproduction rate of 1.25. By 2000, under the assumption of effective fertility control in the world as a whole, their share of population would be reduced to 23%.

Therefore, in analyzing the alternatives of world population growth in the next 30 to 70 years, it will suffice to concentrate on alternative changes in fertility in the less developed countries, and especially on likely developments in a few large countries.

The total population of developing countries in 1970 was estimated to be about 2,530 million people. Under assumption A (effective control) for fertility decline, by the year 2000 there would be 4,500 million inhabitants of those areas, an increase of almost 80%. This would require a decline in the crude birth rate (CBR) from the level of 42 per 1,000 in 1970 to 24 in 2000 (Table 2), or an annual average decrease of 0.6 per 1,000. If fertility trends decline less rapidly during the next 30 years—that is, if efforts to achieve NRR of 1 by 2000 are unsuccessful and the population reaches this rate some 40 years later—the

**Population Projections and Other Demographic Indicators—World,
Developed Countries, Developing Countries, 1970-2100**

Region	Assump- tion ⁽¹⁾	1970	1975	1980	1985	2000	2050	2075	2100
World Total									
Population (millions)	A	3,652	4,019	4,402	4,796	5,916	8,136	8,348	8,386
	B	3,652	4,042	4,475	4,956	6,690	13,444	15,306	15,815
Percent Increase (base, 1970)	A	—	10	20	31	62	124	129	130
	B	—	11	22	36	83	268	319	333
Average Annual Growth Rates (%) ⁽²⁾	A	1.99	1.91	1.82	1.71	1.20	0.28	0.06	0.00
	B	1.99	2.03	2.04	2.04	1.96	0.82	0.31	0.04
Percent under 15 yrs. ⁽³⁾	A	37.0	—	—	34.5	29.1	20.3	19.8	19.8
	B	37.0	—	—	36.6	34.7	23.7	20.3	20.3
Dependency ratio ⁽⁴⁾	A	0.74	—	—	0.66	0.55	0.52	0.57	0.57
	B	0.74	—	—	0.72	0.60	0.52	0.53	0.53
Developed Countries	A	1,122	1,169	1,217	1,263	1,388	1,610	1,622	1,623
	B	1,122	1,171	1,222	1,274	1,431	1,853	1,931	1,952
Developing Countries									
Population (millions)	A	2,530	2,850	3,185	3,533	4,528	6,525	6,727	6,763
	B	2,530	2,871	3,253	3,682	5,259	11,591	13,374	13,863
Percent Increase (base, 1970)	A	—	13	26	40	79	158	166	167
	B	—	13	29	46	108	358	429	448
Average Annual Growth Rates (%) ⁽²⁾	A	2.6	2.4	2.3	2.1	1.4	0.3	0.1	0.0
	B	2.6	2.6	2.5	2.5	2.3	0.9	0.3	0.0
Percent under 15 yrs. ⁽³⁾	A	41.6	—	—	38.2	31.4	20.8	19.9	20.0
	B	41.6	—	—	40.6	38.2	24.8	19.7	19.7
Dependency Ratio ⁽⁴⁾	A	82.0	—	—	72.0	56.3	50.4	56.1	56.0
	B	82.0	—	—	79.2	73.0	48.2	51.1	51.1

⁽¹⁾ For projection A, a linear decline in the GRR is assumed to a level which corresponds to NRR=1 by 2000-2005; this decline is equated with effective fertility control.

Projection B represents population trends under the assumption that NRR=1 will not be achieved until 2045; this situation is considered likely to occur if efforts for fertility control continue at the present levels.

⁽²⁾ Annual growth rates for preceding five-year period.

⁽³⁾ For the female population.

⁽⁴⁾ Ratio of female population under 15 and over 65 to population 15-64 years.

Source: Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

LDCs will be inhabited by 5,300 million people in the year 2000.

The possibility of an additional 800 million in the year 2000 under assumption B, however, is less significant than the difference in total numbers under the two assumptions by the time a stationary population is arrived at. By 2050, assumption A would result in total population in the LDCs of 6,500 million, compared with 11,600 million under assumption B. It would still grow to 6,700 million under assumption A, or to 13,400 million under assumption B, before becoming stationary by approximately 2075. Population trends for the years 1970-2075 are presented for main world regions and large countries in Table 3.

The consequences of slow fertility decrease have to be measured in terms of the unavoidable ultimate size of the population. Although

Annex 1
Table 2

Projected Birth Rates⁽¹⁾ per 1000 Population—World, Developing Regions—Selected Countries, 1965-2025

Region	Assump- tion ⁽²⁾	1965-70	1970-75	1975-80	1980-85	1985-90	1990-95	1995-2000	2020-2025
World Total	A	34.5	32.4	30.4	28.5	26.6	24.3	21.8	16.5
	B		33.6	32.9	32.1	31.3	30.5	29.6	24.0
Developed Countries	A	18.8	18.6	18.2	17.8	17.2	16.4	15.8	14.0
	B		18.8	18.9	18.7	18.2	17.7	17.4	15.6
Developing Countries	A	41.8	38.2	35.3	32.5	29.8	27.0	23.7	17.2
	B		39.9	38.3	36.9	35.7	34.4	33.0	24.6
East Asia	A	34.5	32.2	29.8	27.5	25.3	23.3	21.2	16.4
	B		33.3	31.9	30.4	29.2	28.3	27.4	21.3
South Asia	A	44.1	39.9	36.6	33.7	30.8	27.6	23.8	17.1
	B		41.7	40.1	38.7	37.5	36.1	34.5	25.4
India	A	41.4	38.1	35.4	32.9	30.1	27.1	23.6	17.1
	B		39.7	38.4	37.3	36.0	34.4	32.9	24.6
Iran	A	45.0	40.8	38.5	36.4	33.1	28.9	24.3	17.2
	B		42.8	42.5	42.1	40.8	38.6	36.5	26.7
Malaysia ⁽³⁾	A	36.0	34.4	32.9	30.6	27.7	24.5	21.2	17.0
	B		36.1	36.0	35.1	33.4	31.6	30.1	22.9
Pakistan	A	42.3	41.1	40.0	37.3	33.2	28.8	24.2	17.0
	B		43.2	44.0	43.0	40.9	38.4	36.4	26.6
Philippines	A	45.2	41.3	38.2	35.6	32.5	28.5	24.1	17.3
	B		43.4	42.1	41.2	39.9	37.9	35.9	26.2
Thailand	A	41.1	37.9	35.2	32.4	29.5	26.2	22.4	16.7
	B		39.8	38.6	37.5	36.2	34.7	33.1	31.5
Turkey	A	36.0	34.2	32.9	31.2	28.5	25.3	22.0	16.5
	B		35.7	35.8	35.4	34.0	32.2	30.5	23.2
Africa	A	45.8	41.9	38.5	35.7	32.7	29.2	25.3	18.1
	B		43.8	42.0	40.6	39.2	37.5	35.7	26.2
Egypt	A	44.5	40.3	36.7	33.7	31.1	27.9	24.0	17.1
	B		42.1	40.2	38.7	37.6	36.4	34.7	25.6
Ghana	A	49.2	44.7	41.0	38.3	34.7	30.3	25.6	18.0
	B		46.7	45.2	44.1	42.2	39.9	37.7	27.4
Kenya	A	49.6	44.3	40.2	36.5	32.9	29.3	25.1	17.6
	B		46.3	44.0	41.9	40.1	38.1	36.7	26.5
Tunisia	A	45.3	41.2	37.9	35.1	32.0	28.3	24.0	17.4
	B		43.3	41.7	40.6	39.3	37.6	35.8	26.1
Latin America	A	39.4	36.4	33.8	31.5	28.9	25.9	22.5	16.6
	B		37.9	36.9	35.9	34.6	33.3	31.9	23.9
Brazil	A	38.6	35.9	33.5	31.1	28.4	25.4	22.1	16.5
	B		37.4	36.5	35.5	34.1	32.6	31.1	23.5
Colombia	A	38.0	36.4	34.9	32.8	29.5	25.8	22.1	16.6
	B		38.0	38.1	37.4	35.4	33.1	31.3	23.6
Mexico	A	44.6	40.6	37.4	34.4	31.5	27.9	23.7	17.0
	B		42.6	41.2	40.0	38.7	37.3	35.7	26.1

(1) Female birth rates resulting from projections multiplied by factor 1.025.

(2) Assumptions used for projections: See Footnote (1), Table 1.

(3) Not including Sabah and Sarawak.

Source: Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

Alternative Population Projections 1970-2075—World, Developed Countries, Developing Countries, Selected Large Countries (Millions)

Region	Assump- tion ⁽¹⁾	1970	1975	1980	1985	1990	1995	2000	2050	2075
World Total	A	3,652.1	4,019.3	4,401.9	4,796.4	5,191.9	5,571.9	5,916.1	8,135.7	8,348.4
	B		4,041.7	4,474.8	4,956.1	5,485.9	6,064.2	6,690.1	13,443.6	15,305.6
Developed Countries	A	1,122.2	1,169.4	1,216.7	1,263.2	1,309.0	1,350.6	1,388.1	1,610.3	1,621.7
	B		1,171.1	1,221.9	1,274.0	1,327.6	1,379.8	1,431.3	1,852.9	1,931.2
Developing Countries	A	2,529.9	2,849.9	3,185.2	3,533.2	3,882.9	4,221.3	4,528.0	6,525.4	6,726.7
	B		2,870.6	3,252.9	3,682.1	4,158.3	4,684.4	5,258.8	11,590.7	13,374.4
East Asia	A	940.8	1,034.6	1,129.6	1,223.5	1,315.2	1,403.5	1,485.0	2,001.7	2,053.4
	B		1,039.9	1,146.4	1,259.2	1,379.1	1,507.8	1,645.5	3,010.9	3,358.0
South Asia	A	1,102.7	1,253.1	1,413.0	1,582.1	1,755.4	1,925.0	2,079.3	3,076.6	3,153.5
	B		1,263.4	1,447.0	1,658.1	1,898.2	2,168.7	2,468.9	5,915.8	6,896.0
India	A	534.3	598.3	666.7	739.0	812.4	883.5	948.3	1,365.5	1,402.0
	B		602.5	680.5	769.6	869.3	979.5	1,100.2	2,431.8	2,799.0
Iran	A	27.9	31.9	36.5	41.5	46.7	51.8	56.2	85.9	88.1
	B		32.2	37.4	43.7	51.1	59.4	68.4	179.8	212.9
Malaysia ⁽²⁾	A	9.4	10.7	12.2	13.8	15.4	16.9	18.3	26.8	27.4
	B		10.8	12.5	14.5	16.6	18.9	21.3	47.3	54.2
Pakistan	A	126.2	144.9	166.7	190.7	215.1	238.4	259.6	398.9	408.4
	B		146.2	171.3	201.3	235.3	273.3	315.8	831.0	981.8
Philippines	A	37.8	44.0	50.6	57.8	65.1	72.3	78.6	118.6	121.9
	B		44.4	52.0	60.9	71.2	82.6	95.2	239.7	282.0
Thailand	A	36.6	42.1	48.0	54.2	60.5	66.6	72.1	105.5	107.6
	B		42.4	49.2	56.9	65.6	75.4	86.0	202.2	233.7
Turkey	A	34.5	38.5	43.0	47.8	52.7	57.4	61.6	88.4	90.8
	B		38.8	43.8	49.7	56.3	63.4	70.9	151.4	173.3
Africa	A	344.2	386.9	432.4	480.5	529.6	577.2	620.2	899.2	929.0
	B		389.9	442.2	502.3	570.2	645.9	729.1	1,663.6	1,931.6
Egypt	A	33.5	37.9	42.7	47.6	52.8	57.8	62.4	91.7	93.8
	B		38.3	43.7	49.9	57.0	65.1	74.0	176.3	205.1
Ghana	A	9.0	10.1	11.4	12.8	14.2	15.6	16.8	24.8	25.4
	B		10.2	11.7	13.4	15.5	17.7	20.2	49.8	58.2
Kenya	A	10.9	12.5	14.1	15.8	17.6	19.2	20.7	30.3	31.0
	B		12.6	14.5	16.6	19.1	21.8	24.8	59.7	69.5
Tunisia	A	5.0	5.8	6.5	7.4	8.3	9.2	9.9	14.7	15.1
	B		5.8	6.7	7.8	9.0	10.4	12.0	29.5	34.5
Latin America	A	283.2	323.8	366.7	411.3	456.4	500.0	539.7	797.3	818.8
	B		326.2	374.5	428.7	488.8	554.7	625.9	1,396.4	1,614.3
Brazil	A	94.0	107.6	122.1	137.3	152.7	167.5	180.9	265.9	272.8
	B		108.3	124.7	143.0	163.3	185.4	209.3	459.3	528.9
Colombia	A	21.1	24.1	27.5	31.1	34.7	38.1	41.2	60.3	61.7
	B		24.3	28.1	32.5	37.2	42.3	47.7	104.8	120.4
Mexico	A	50.7	59.5	68.9	79.1	80.4	99.6	108.7	167.9	172.5
	B		60.0	70.8	83.3	97.5	113.6	131.3	335.4	396.8

⁽¹⁾ Assumptions used for projections: See Footnote (1), Table 1.⁽²⁾ Not including Sabah and Sarawak.

Source: Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

assumption B implies also a decline in the CBR of developing countries from 42 in 1970 to 33 in the year 2000, and a drop in total fertility¹ from 5.7 in 1970 to 4.3 in 2000 (see Table 4), this would not be enough to stop growth for at least 60-75 additional years. By then, the absolute size would exceed 13,000 million persons—twice as many as under assumption A.

Accepting the desirability of achieving population trends nearer to projection A in the LDCs, one can elaborate on the process of fertility change which would be necessary and on the likelihood of such change taking place.

In the LDCs, under assumption A the population would achieve NRR of 1 by 2000 and would stabilize some 75 years later at approximately 6,700 million. For this situation to occur, the total fertility rate would have to decrease from a level of 5.7 in 1970 to less than three in 2000 (2.8 children per woman, see Table 4). As indicated above, the resulting birth rate would decline at a speed of 0.6 per 1,000 per year, reach a level of 24 by 2000, and further stabilize at about 17 per 1,000 25 years later (Table 2).

What would make the difference between a situation conducive to changes in fertility from assumption B to assumption A? This question may be answered by showing how many live births would take place annually in both situations, indicating the magnitude of the difference, and estimating the number of women who would need to practice contraception yearly in order to prevent the excess births. Table 5 shows projected live births for the world, the LDCs, and several regions and countries.

The difference between the numbers of births under assumptions A and B may be taken as an estimate of the additional number of births which would have to be averted annually by expanded population planning programs to accomplish population trends similar to projection A. This has been summarized in Table 6. Thus, in the five year period 1970-75 it would be necessary to avert 4.8 million births per year in the LDCs; these annual averages would increase to 11 million by 1975-80 and up to about 60.5 million births by the year 2000.

Since population growth in the developed countries is already slow, and in these projections it is assumed that it will stop in the near future, it may be expected that after the year 1985 birth prevention beyond the levels of present contraceptive practice will have to take place in the LDCs. During the period 1970-2000, half the magnitude of birth prevention to achieve projection A instead of B would

¹Sum of five-year interval age-specific fertility rates multiplied by five; it is interpreted as an indicator of "children per woman."

Projected Total Fertility Rates per Woman⁽¹⁾—World, Developed Countries, Developing Countries, Selected Large Countries, 1965-2025

Region	Assump- tion ⁽²⁾	1965-70	1970-75	1975-80	1980-85	1985-90	1990-95	1995-2000	2020-2025
World Total	A	4.74	4.38	4.02	3.66	3.30	2.94	2.58	2.15
	B		4.56	4.39	4.21	4.04	3.86	3.69	2.81
Developed Countries	A	2.66	2.58	2.50	2.42	2.34	2.26	2.18	2.08
	B		2.63	2.59	2.55	2.51	2.47	2.43	2.24
Developing Countries	A	5.74	5.25	4.77	4.28	3.79	3.31	2.82	2.20
	B		5.50	5.26	5.02	4.78	4.54	4.30	3.09
South Asia	A	6.15	5.60	5.04	4.49	3.93	3.38	2.82	2.16
	B		5.88	5.61	5.35	5.08	4.81	4.54	3.20
India	A	5.55	5.08	4.62	4.16	3.69	3.23	2.77	2.19
	B		5.32	5.09	4.86	4.63	4.41	4.18	3.04
Iran	A	6.76	6.12	5.47	4.83	4.18	3.54	2.89	2.15
	B		6.46	6.15	5.84	5.53	5.22	4.91	3.36
Malaysia ⁽³⁾	A	5.31	4.86	4.40	3.95	3.49	3.04	2.58	2.10
	B		5.09	4.88	4.66	4.45	4.23	4.02	2.94
Pakistan	A	6.53	5.91	5.30	4.68	4.07	3.45	2.84	2.14
	B		6.23	5.94	5.64	5.35	5.06	4.76	3.29
Philippines	A	6.77	6.12	5.48	4.84	4.19	3.55	2.90	2.17
	B		6.46	6.15	5.84	5.53	5.22	4.91	3.35
Thailand	A	6.15	5.58	5.02	4.45	3.88	3.32	2.75	2.15
	B		5.88	5.61	5.34	5.07	4.81	4.54	3.19
Turkey	A	5.30	4.86	4.43	3.99	3.55	3.11	2.67	2.16
	B		5.09	4.88	4.66	4.45	4.24	4.02	2.95
Africa	A	6.35	5.80	5.24	4.68	4.12	3.56	3.01	2.28
	B		6.08	5.80	5.52	5.24	4.96	4.68	3.28
Egypt	A	6.14	5.59	5.04	4.49	3.94	3.39	2.83	2.17
	B		5.88	5.61	5.34	5.07	4.81	4.54	3.20
Ghana	A	6.97	6.32	5.68	5.03	4.38	3.74	3.09	2.26
	B		6.65	6.33	6.01	5.69	5.37	5.05	3.45
Kenya	A	6.75	6.13	5.51	4.89	4.27	3.65	3.02	2.23
	B		6.45	6.14	5.84	5.53	5.22	4.92	3.38
Tunisia	A	6.77	6.13	5.49	4.85	4.21	3.56	2.92	2.19
	B		6.46	6.15	5.84	5.53	5.22	4.91	3.36
Latin America	A	5.54	5.07	4.60	4.13	3.66	3.19	2.72	2.20
	B		5.31	5.09	4.86	4.64	4.41	4.19	3.06
Brazil	A	5.38	4.93	4.48	4.03	3.58	3.13	2.68	2.20
	B		5.16	4.95	4.74	4.52	4.31	4.09	3.02
Colombia	A	5.56	5.08	4.61	4.14	3.67	3.20	2.72	2.20
	B		5.33	5.10	4.88	4.65	4.43	4.20	3.07
Mexico	A	6.54	5.92	5.31	4.69	4.07	3.46	2.84	2.19
	B		6.25	5.96	5.66	5.37	5.08	4.79	3.33

(1) Sum of age-specific fertility rates multiplied by 5; it is interpreted as an indicator of "children per woman."

(2) Assumptions used for projections: See Footnote (1), Table 1.

(3) Not including Sabah and Sarawak.

Source: Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

Annex 1

Table 5

Projected Annual Average Number of Live Births⁽¹⁾—World, Developed Countries, Developing Countries, Selected Large Countries, 1970-2000 (Thousands)

Region	Assumptions ⁽²⁾	1970-75	1975-80	1980-85	1985-90	1990-95	1995-2000
World Total	A	124,090	128,160	131,260	132,758	131,052	125,200
	B	129,170	139,954	151,238	163,560	176,272	188,548
Developed Countries	A	21,255	21,761	22,120	22,147	21,808	21,608
	B	21,511	22,566	23,287	23,726	24,001	24,485
Developing Countries	A	102,835	106,399	109,140	110,611	109,244	103,592
	B	107,659	117,388	127,951	139,834	152,271	164,063
East Asia	A	31,789	32,276	32,320	32,137	31,628	30,643
	B	32,991	34,847	36,616	38,536	40,835	43,149
South Asia	A	46,966	48,780	50,501	51,485	50,738	47,611
	B	49,354	54,313	60,153	66,707	73,366	80,098
India	A	21,593	22,366	23,125	23,376	22,946	21,593
	B	22,547	24,657	27,052	29,482	31,836	34,213
Iran	A	1,220	1,318	1,420	1,460	1,424	1,312
	B	1,287	1,480	1,709	1,934	2,135	2,332
Malaysia ⁽³⁾	A	345	377	398	404	396	373
	B	365	419	474	520	561	606
Pakistan	A	5,572	6,228	6,668	6,738	6,531	6,023
	B	5,877	6,980	8,021	8,928	9,774	10,718
Philippines	A	1,689	1,808	1,928	1,996	1,958	1,817
	B	1,781	2,030	2,326	2,633	2,916	3,190
Thailand	A	1,492	1,584	1,655	1,693	1,668	1,557
	B	1,571	1,770	1,990	2,216	2,450	2,672
Turkey	A	1,249	1,341	1,414	1,432	1,394	1,311
	B	1,307	1,474	1,653	1,804	1,927	2,051
Africa	A	15,327	15,786	16,283	16,516	16,166	15,157
	B	16,063	17,482	19,166	20,995	22,809	24,523
Egypt	A	1,438	1,479	1,522	1,559	1,542	1,441
	B	1,512	1,647	1,813	2,011	2,221	2,417
Ghana	A	426	443	464	469	452	415
	B	449	495	554	610	662	714
Kenya	A	518	534	545	549	539	501
	B	544	596	652	715	788	855
Tunisia	A	222	234	244	251	247	229
	B	234	260	294	330	365	400
Latin America	A	11,043	11,677	12,241	12,539	12,400	11,722
	B	11,556	12,929	14,407	15,895	17,382	18,817
Brazil	A	3,616	3,850	4,027	4,117	4,069	3,857
	B	3,784	4,251	4,747	5,228	5,683	6,130
Colombia	A	822	902	961	972	940	877
	B	863	999	1,134	1,232	1,316	1,407
Mexico	A	2,236	2,402	2,548	2,509	2,509	2,455
	B	2,360	2,695	3,080	3,502	3,938	4,368

(1) Births estimated on the basis of projected population and resulting birth rates in model (shown in Table 2), under assumptions A and B.

(2) Assumptions used for projections: See Footnote (1), Table 1.

(3) Not including Sabah and Sarawak.

Estimated⁽¹⁾ Average Annual Number of Births Omitted if Projection A Instead of B is Achieved, 1970-2000 (Thousands)

Region	1970-75	1975-80	1980-85	1985-90	1990-95	1995-2000
World Total	5,080	11,794	19,978	30,802	45,220	63,348
Developed Countries	256	805	1,167	1,579	2,193	2,877
Developing Countries	4,824	10,989	18,811	29,223	43,027	60,471
South Asia	2,388	5,533	9,652	15,222	22,628	32,487
India	954	2,291	3,927	6,106	8,890	12,620
Iran	67	162	289	474	711	1,020
Malaysia ⁽²⁾	20	42	76	116	165	233
Pakistan	305	752	1,353	2,190	3,243	4,695
Philippines	92	222	398	637	958	1,373
Thailand	79	186	335	523	782	1,115
Turkey	58	136	239	372	533	740
Africa	736	1,696	2,883	4,479	6,643	9,366
Egypt	74	168	291	452	679	976
Ghana	23	52	90	141	210	299
Kenya	26	62	107	166	249	354
Tunisia	12	26	50	79	118	171
Latin America	513	1,252	2,166	3,356	4,982	7,095
Brazil	168	401	720	1,111	1,614	2,273
Colombia	41	97	173	260	376	530
Mexico	124	293	532	993	1,429	1,902

(1) Estimates obtained by difference between the number of births under projections A and B, shown in Table 5.

(2) Not including Sabah and Sarawak.

have to take place in South Asia. In India alone the share of birth prevention would be more than 20% of that required for the entire group of LDCs.

Table 7 gives the total number of live births during the 30-year period 1970-2000 in the world as a whole, in the less developed countries, and in several large countries under alternative assumptions A and B, and the number that would need to be averted to achieve projection A instead of B. During that period about 840 million live births would have to be prevented in the LDCs. Of that number, almost half (46%) would have to be prevented in the 14 countries mentioned in Table 7.

In order to accomplish projection A, the number of women who would have to practice contraception each year through the period 1970-2000 has been calculated and presented in Table 8. In 1970-75 it is estimated that an average of about 19.3 million women (or 3.3%

Annex 1
Table 7

Projected Number of Births and Births Omitted, 1970-2000 (Millions)

Region	Total Number of Births 1970-2000		Births Omitted	Percent ⁽²⁾
	Projection A ⁽¹⁾	Projection B ⁽¹⁾		
World Total	3,862	4,744	882	100.0
Developed Countries	653	698	45	5.1
Developing Countries ⁽³⁾	3,209	4,046	837	94.9
South Asia	1,480	1,920	440	49.9
India	675	849	174	19.7
Iran	41	54	13	1.5
Malaysia ⁽⁴⁾	11	15	4	0.4
Pakistan	189	251	62	7.0
Philippines	56	74	18	2.0
Thailand	48	63	15	1.7
Turkey	41	51	10	1.1
Africa	476	605	129	14.6
Egypt	45	58	13	1.5
Ghana	13	17	4	0.4
Kenya	16	21	5	0.6
Tunisia	7	9	2	0.2
Latin America	358	455	97	11.0
Brazil	118	149	31	3.5
Colombia	27	35	8	0.9
Mexico	73	100	27	3.1

⁽¹⁾ Assumptions used for projections: See Footnote (1), Table 1.

⁽²⁾ Ratio of births omitted in each subdivision to world total.

⁽³⁾ During the 30-year period, there would be 4,325 million births in the LDCs under conditions of almost maximum human fertility (constant fertility at the levels of 1965-70, or about 200 live births per 1,000 women 15-44 years); in all, 1,116 million births would have to be averted to make projection A a reality. Of that number, it is expected that about 279 million will be avoided if present contraceptive practices are maintained. Projection A instead of B will be achieved in the LDCs only if about 837 million additional births are avoided in the three decades.

⁽⁴⁾ Excluding Sabah and Sarawak.

of all women 15-44 years of age) would need to be practicing contraception each year in the LDCs in order to prevent 4.8 million live births. The number of women practicing contraception in a year would have to increase to 117 (13.9% of those 15-44 years old) in 1985-90 and to 242 million (22.5%) in 1995-2000.

These calculations were made on the basis of the projected age structures produced by the model, and on the assumption that four women receiving protection for one year are needed to prevent one live birth. If fertility is assumed to continue constant¹ at present levels to the year 2000, it is estimated that the proportion of the female

¹Almost equivalent to a low estimate of maximum human fertility, or 200 live births per 1,000 women 15-44.

Total Average Annual Number of Women 15-44 and Estimated Proportion of Contraceptors Required to Achieve Projection A, 1970-2000 (Thousands)

Region	1970-75			1985-90			1995-2000		
	Women 15-44 ⁽¹⁾	Contraceptors ⁽²⁾		Women 15-44	Contraceptors ⁽²⁾		Women 15-44	Contraceptors ⁽²⁾	
		Number	%		Number	%		Number	%
World Total	820,840	20,320	2.48	1,123,684	123,208	10.96	1,381,432	253,392	18.34
Developed Countries	240,618	1,024	0.42	272,010	6,316	2.32	293,040	11,508	3.93
Developing Countries ⁽³⁾	576,982	19,296 (26,700)	3.34 (5.0)	841,728	116,892 (130,000)	13.89 (16.2)	1,076,165	241,884 (320,000)	22.48 (30.8)
South Asia	249,125	9,552	3.83	375,470	60,888	16.22	494,530	129,948	26.28
India	120,622	3,816	3.16	176,860	24,424	13.81	225,312	50,480	22.40
Iran	5,920	268	4.53	9,790	1,896	19.37	13,528	4,080	30.16
Malaysia ⁽⁴⁾	2,125	80	3.76	3,358	464	13.82	4,355	932	21.40
Pakistan	26,702	1,220	4.57	45,450	8,760	19.27	62,748	18,780	29.93
Philippines	8,365	368	4.40	14,010	2,548	18.19	18,938	5,492	29.00
Thailand	8,245	316	3.83	13,048	2,092	16.03	17,232	4,460	25.88
Turkey	7,628	232	3.04	11,508	1,488	12.93	14,698	2,960	20.14
Africa	77,315	2,944	3.81	115,150	17,916	15.56	148,178	37,464	25.28
Egypt	7,498	296	3.95	11,300	1,808	16.00	14,875	3,904	26.24
Ghana	1,988	92	4.63	3,085	564	18.28	4,035	1,196	29.64
Kenya	2,522	104	4.12	3,775	664	17.59	4,988	1,416	28.39
Tunisia	1,108	48	4.33	1,778	316	17.77	2,388	684	28.64
Latin America	63,888	2,052	3.21	98,268	13,424	13.66	126,842	28,380	22.37
Brazil	21,420	672	3.14	33,205	4,444	13.38	42,505	9,092	21.39
Colombia	4,802	164	3.42	7,715	1,040	13.48	9,812	2,120	21.61
Mexico	11,185	496	4.43	17,705	3,972	22.43	25,725	7,608	29.57

(1) Female population 15-44, estimated on basis of projected age structures as obtained by model (projection A).

(2) Number of women who would need to practice contraception during year (couple-years of protection), in order that projection A is achieved instead of B, is obtained by assuming that four couple-years of protection are needed to avert one birth.

(3) Numbers in parentheses represent the total contraceptors needed to achieve projection A, as compared to a situation of constant fertility at 1965-70 levels.

(4) Not including Sabah and Sarawak.

Source: World Bank, computed on the basis of data from Tomas Frejka (Population Council), "Alternatives of World Population Growth," monograph in process of publication.

population in reproductive ages who would have to use contraception during the year to achieve projection A in the LDCs as compared to potential maximum human fertility would be 5% in 1970-75 (26.7 million), 16.2% in 1985-90 (130 million), and 30.8% in 1995-2000 (320 million).

The estimates in Tables 7 and 8 give an indication of the magnitude of the task required in the next 30 years to reduce fertility in the less developed regions of the world to the levels implied by assumption A.

A second important consideration is the changes in age structure

of the population which alternative fertility declines A and B would bring about. In Table 1 the proportions of female children under 15 are given for the world and the LDCs. Also, the dependency ratios which would result at different points in time are presented. The proportion of the female population under 15 is a consequence of prevailing fertility conditions. In the LDCs the proportion is high—on average in excess of 40%. If in the next 30 years fertility decreases are of the magnitude stated in assumption A, the proportion of females under 15 will gradually decrease to 38% by 1985 and about 31% by 2000, stabilizing at about 20% in the following years. If fertility declines are closer to assumption B, changes in age structure will be much less noticeable, and by 2000 the population under 15 years will still be 38% of the total.

The slow change in age structure will also have implications for the dependency ratio. In the developed countries this ratio indicates an age structure more favorable to the growth of productive activities; therefore, changes in age structure resulting in a decrease of this ratio are considered desirable for development and improvement of economic conditions. If assumption A can be made a reality in the next 30 years, the dependency ratio in the LDCs will drop from 82% at present to 72% in 1985, and to 56% in the year 2000. These ratios would be similar to those prevailing now in the developed countries. If assumption B dominates the trends, however, the change in the dependency ratio will be considerably more moderate, remaining almost unchanged up to 1985 and decreasing to 73% by 2000.

Specific or General Population Targets in 27 Countries

A. Countries with Specific Goals or Targets

Country	1970 Population (Millions)	Estimated 1970 Crude Birth Rate ⁽¹⁾	Specific Goal or Target
Africa			
Egypt	33.3	37	Reduce CBR by one point per year in 1970s.
Mauritius	0.8	26	Reduce CBR from 30 to 20 by 1975.
Morocco	15.5	50	Reduce CBR (from about 50 in 1968) to 45 by 1972 and 35 by 1985.
Tunisia	5.0	41-42	Reduce CBR from 43 in 1968 to 34 in 1975.
Western Hemisphere			
Barbados	0.3	30	Enlist 60,000 women in program in 3 years.
Dominican Republic	4.3	45-48	Reduce CBR to 28 in 10 years.
Jamaica	1.9	32	Reduce CBR from 34.2 per 1,000 in 1968 to 25 per 1,000 by 1976.
Trinidad & Tobago	1.1	28	Reduce CBR to 19 per 1,000 by 1977.
Asia			
China, Republic of	14.7	27	Initial target was to reduce the rate of growth from 3% to 1.9% by 1973. Current target is to reduce the CBR from 27.1 at end of 1970 to 24.4 by 1976.
Korea, Republic of	31.9	30-32	Achieve a 2% population growth rate by December 1971 and 1.5% by 1976.
India	552.0	40	Reduce CBR to 32 by end of Fourth Plan (1974) and to 25 six to eight years later.
Indonesia	118.0	40-45	Reduce birth rate. Current five-year plan sets a target of six million acceptors.
Iran	28.7	46	Decrease annual population growth rate from 3% to 2%.
Malaysia	10.4	37	Achieve 2% population growth rate by 1985.
Nepal	11.1	n.a.	Tentative target of 2% population growth rate.
Pakistan	134.0	45-50	Recommended goal for Fourth Five-Year Plan (1970-75) is to reduce CBR from estimated 41-43 in 1970 to 33.2 in 1975, with 31% of fertile couples effectively using contraception.
Singapore	2.1	22	Reduce CBR from 32 in 1964 to below 20 in the five year National Family Planning Program, 1966-70.
Thailand	35.7	40-45	Reduce population growth rate from 3.3% in 1970 to 2.4% by 1980.

(continued)

Annex 2

B. Countries with General Goals

Country	1970 Population (Millions)	Estimated 1970 Crude Birth Rate ⁽¹⁾	General Goal
Africa			
Botswana	0.7	n.a.	Reduce population growth rate.
Ghana	9.0	50	(1969) Reduce the population growth rate and give Ghanaians choice of family size.
Kenya	10.8	50	Provide family planning services to combat malnutrition, improve maternal and child health, and slow rate of population growth.
Nigeria	66.4	50-55	Provide information, facilities, and services to families to enable them to achieve desired family size.
Western Hemisphere			
Puerto Rico	2.8	26	Provide services through the Family Planning Association.
Asia			
Ceylon	12.5	32	Government's position has shifted from reducing birth rate (1965) to support for family planning programs in the interest of maternal and child health.
China, People's Rep. of	750-950	36-40	Degree of expressed official interest varies, but fertility control services are widely available. Government advocates late marriage and small families.
Philippines	38.4	44-50	All agencies providing services are to cooperate in making family planning efforts effective.
Turkey	35.5	40	Population Planning Law No. 557 states that every Turkish couple should have the number of children it wishes.

(1) All crude birth rates (CBR) are per 1,000 population per year.
n.a. = Not available.

Sources: United Nations, 1970 Demographic Yearbook.
Nortman, Dorothy, "Population and Family Planning Programs: A Factbook," 1971 edition, *Reports on Population/Family Planning*. The Population Council, New York, June, 1971, tables 4 and 5, pp. 5-15. A few of the crude birth rate figures and goals are based on recently available information.

CONTRACEPTIVE METHODS

Of all the species, only man can control his fertility. This unique ability is exercised by interfering with the biological consequences of sexual intercourse at any one of several steps in the process of conception, fetal development and birth.

Various methods of preventing conception have long been known and practiced: coitus interruptus, male sterilization through castration, and various folk preparations of uncertain effect and reliability. Within recent years, there have been significant advances in knowledge of reproductive biology and in the development of contraceptive technology. The two most widely known and used of the newer methods are, of course, "the pill" and "the loop," but other promising methods are under trial or development. With increased research, still more and better methods can be expected.

Family planning, or birth control, is the application of scientific knowledge by couples to regulate the number and spacing of their children. It makes birth a process of choice rather than chance. All scientific methods of accomplishing this—whether surgical, medical, mechanical or behavioral—rely on interference at some point in a complex series of events which must occur in perfect harmony to result in pregnancy.

This can be done by blocking the passages through which the ovum and sperm must travel to meet, by changing the hormonal balance to prevent ovulation or sperm formation, by altering the wall of the uterus so that it becomes nonreceptive to the ovum, or by limiting sexual intercourse to times when no ovum is exposed to fertilization.

Some methods, such as male or female sterilization, diaphragms, oral contraception and intrauterine devices, require medical supervision. Others, such as the condom, rhythm, vaginal creams, jellies and suppositories, do not.

A good contraceptive must be reliable, effective, and simple to use. It should not interfere with sex activity or be harmful to either partner. It should not affect fertility unless used as a terminal method. Finally, it must be inexpensive and easily supplied to large numbers of people. All methods now known have some disadvantages, and all have their failures. There is no perfect contraceptive. The method chosen must therefore be a matter of compromise and personal preference. Each of the main categories of methods is described below.

Oral Contraceptives (The “Pill”)

From ancient times, there has been speculation about the use of medicines taken by mouth to prevent childbirth. It was not until the early 1950s, however, that a scientific oral method became available. Pincus and Rock had worked on experiments with hormone preparations and developed their “pill,” which was first tried out in Puerto Rico beginning in 1956. This work was based on experience in the use of certain hormones in the treatment of women’s diseases, for regulation of the menses, for severe pain during menstruation, and for subfertility.

During normal pregnancy, the ovary produces certain hormones which help the fertilized egg to continue to develop in the womb. These hormones in the blood stream decrease the capacity of the pituitary gland to produce other hormones which cause the ovaries to develop eggs; the absence of the pituitary hormones causes ovulation to be suppressed. The “pill” produces a hormonal condition similar to pregnancy, in that no egg cells are released. The original “pill” was a combination of two types of hormones—one stops egg production, the other helps menstruation to occur. Several brands now on the market vary slightly in composition but also employ two hormones to achieve the same results.¹ The routine requires that 20 or 21 tablets be taken orally every month, beginning on the fifth day of the menstrual cycle (counting the first day of the period as day one). A “sequential” pill has also been developed which is taken every day of the month without interruption.

When the course is finished, menstruation will occur within two to three days, and the course will be repeated again from the fifth day of its start. For women who faithfully take these pills, success is 100%. Side effects such as nausea and vomiting, fullness of breast, and headaches have been reported, but most of these cease to occur in time. Weight changes may also occur. Medical complications in association with the use of these oral progestagens, e.g., thromboembolic conditions, etc., are worth attention, but it has still to be shown that they occur more frequently among pill users than among other women of similar age and history.

Other contingencies, largely hypothetical, are also much discussed, but these questions will not be resolved until enough experience of prolonged use by women and other species has accumulated. The “pill” is already aesthetically acceptable, however, because its use is removed from the time of the sex act. It is the most widely used contraceptive among women in developed countries, and in some of the

¹There are newer varieties being developed with other action; these are discussed below under “Prospective Methods.”

national programs of developing countries. The discovery of oral contraceptives has revolutionized family planning methods.

The Intrauterine Device (IUD)

The use of small devices inserted and left in the womb is a revival and modernization of older methods, such as metal buttons, stems and Grafenburg Rings, which were used about 40 years ago. They were frowned upon by most medical people on the ground that they might cause infection or cancer.

Modern IUDs are made of stainless steel or plastic impregnated with barium sulphate, which makes them visible under x-rays. They are made in a variety of shapes. The more well-known are the Margulies Spiral, Lippes Loop, Birnberg Bow, and Ota Ring. These devices are threaded through an inserter which straightens them for easy introduction into the uterus; after they are released in the womb, they regain their original shape which helps to keep them in place. Insertion is usually quite easy, and no anesthetic is needed for women who have had children (IUDs are not recommended for others). Removal normally requires medical attention.

The IUD is fairly effective, with a pregnancy rate of 4% at the end of one year of use. The failure rate declines with subsequent years of use. It is superior to more conventional forms of contraceptives and is inexpensive, with no recurrent cost. Once fitted, it can be left in place for at least two years; in fact, no ill effects have been reported from cases of much longer use.

The IUD is a simple method, once inserted, and requires no further motivation. It is also the only reversible form of contraception which does not rely on the user for its success, and therefore is more suited for couples who are not constantly motivated. The IUD, like the pill, does not require any precoital or postcoital preparation. The main disadvantage, aside from the rather small chance of pregnancy, is that some women who cannot tolerate the presence of foreign bodies in the uterus suffer cramps and various degrees of bleeding. Some women also cannot retain the IUD, and expel it.

Permanent Methods

Sterilization renders a person incapable of reproduction, and the result is usually permanent. Although there are many ways to render a person sterile, in practice the methods most commonly employed are to cut and tie the fallopian tubes in women (tubal ligation) or the spermatic ducts in men (vasectomy).

Sterilization may be advised in cases of ill health as well as a means

of family limitation. Because of the method's finality, it never gained much acceptance until the recent awakening to the population problem. Even today, the acceptability of both male and female sterilization varies greatly among different countries.

Both popular and professional views as to how many children a couple should have before considering sterilization have changed in recent times. Whereas formerly doctors in many areas were loathe to agree to such operations for families with less than six or eight children, it is likely that most today would accept three or four as a more realistic figure. Sterilization below the age of 30 is generally discouraged. Each case must be considered on its merits, taking account of all relevant factors: the number, sex and health of the family's children, the couple's economic circumstances, and experience with other family planning methods.

The exact legal position varies in different countries, but generally voluntary sterilization is permissible if the couple fully understand the nature and permanency of the procedure. Cases considered for sterilization are those of couples who have reached the desired family size and where both partners give their unequivocal consent. The operation must be done in good faith and for the welfare of the family concerned.

In men, sterilization is performed by blocking the seminal duct through which the sperm move out of the testicles to join the seminal fluid. This simple operation is called vasectomy and does not require a general anesthetic or hospitalization. It can be completed within 10 minutes under a local anesthetic on an outpatient basis. Only a half inch incision is made on each side through the skin in the scrotum to cut and tie off the vas deferens, just under the skin. Nothing is removed and there is no change in sexual drive or capacity.

In women the operation, though not a serious one, does necessitate hospitalization and is done under general anesthesia. It is conveniently performed within 24 hours after delivery—ideally as a postpartum procedure. A small abdominal incision is made in order to tie the fallopian tubes which carry the ovum to the womb. The patient is usually discharged from the hospital in four to six days, and can gradually resume her normal activities after the usual recovery period advised after childbirth, i.e., about two weeks. The woman's chemistry is not affected and she will continue to have her menses normally. Nothing has been removed and her physical well-being and sexual characteristics are not affected.

It is possible to carry out this operation intra-vaginally, but the procedure is more complex and requires highly competent surgery; it is not yet suited for general use. Research is under way to develop

techniques for blocking the tubes by chemical injection through the cervical canal.

Traditional Methods

Other contraceptive devices of varying efficiency, depending on the motivation, knowledge and interest of the user, are the condom for men and the vaginal diaphragm and spermicides for women.

The diaphragm, which was used most successfully in developed countries before the advent of the pill, has several disadvantages, such as the need for a suitable housing environment, pelvic examination and fitting by a physician, and elaborate preparations for use.

Spermicides are chemical products in the form of jellies, creams and foams which have the effect of immobilizing the sperm on contact. These are preparations relatively easy to use, but they are not so effective.

Rhythm Method

In virtually all societies, it has been known that women could conceive only during a certain part of the menstrual cycle. This fact is the basis of the rhythm method of avoiding conception. Early ideas about the fertile and sterile periods of the menstrual cycle, however, were often mistaken. Much has been learned about them in recent years.

Two varieties of the rhythm method are now practiced: calendar rhythm and temperature rhythm. Calendar rhythm, developed in the 1920s, depends upon estimation of the day of ovulation by a formula based on the individual woman's menstrual history recorded over a number of months. Abstinence is prescribed for a few days before and after the estimated day of ovulation.

More recently the temperature rhythm, based on the principle of the rise of basal body temperature at the time of ovulation, has been used to determine that ovulation has occurred; marital relations are permitted during the postovulatory phase only. The rhythm method is based on the avoidance of coitus when it could result in the simultaneous presence of a fertilizable ovum and mobile sperm.

The contraceptive effectiveness of the rhythm method has been the subject of much controversy. Correctly taught and understood, and consistently practiced, it may be quite effective, especially the method based on temperature records. Successful practice, however, requires considerable self discipline and an equally strong desire to control fertility. Self-taught rhythm, haphazardly practiced, is a very ineffectual method of contraception. It has never been used on a mass basis.

Abortion

Abortion is any termination of pregnancy before the 28th week, the stage before the fetus is regarded as viable and capable of an independent existence. Pregnancies can be medically terminated for medical and social reasons. Pregnancies can also abort spontaneously (if before the 28th week, an abortion; if later, a miscarriage); it is estimated that about 10% terminate this way, usually in the third month or earlier.

The traditional method of terminating early pregnancy (before 12 weeks) is by the operation termed dilation and curettage (D and C), which involves the scraping of fetal contents from the uterine wall. This operation is usually done under surgical operating conditions, though it can be done as an outpatient procedure if the pregnancy is of less than 12 weeks. More modern is the use of a "suction method" to evacuate the uterus. This relatively simple and safe outpatient method was developed in Eastern Europe. Its use is increasing rapidly in many countries where abortion laws have been liberalized.

Therapeutic abortion is sometimes permitted if doctors of consultant status agree that a woman's life might be jeopardized or her health endangered or seriously impaired should the pregnancy continue. Social abortions are usually authorized by regulatory tribunals, although recent legislation in the United Kingdom and some jurisdictions in the United States allows the procedure to be practiced almost "on demand."

Since the last war, Japan has brought down its birth rate to a very low level by legalizing abortion on medical or social grounds. The idea behind more liberal abortion laws is that a woman should have the right to decide whether to give birth, and that legal abortion in a hospital will be much safer than an illegal one.

The rate of illegal abortions is difficult to estimate but ranges from 10% to 30% of births, depending on the country. The incidence of such abortions, which cause much maternal morbidity and even death, can be reduced by more liberal attitudes towards abortion itself and by encouraging contraceptive practice. In some countries, there are so many illegal abortions that strong efforts are now being made to encourage family planning as an alternative.

Prospective Methods

There is common agreement that additional research on the biomedical basis of contraception is needed. The world total of expenditure in this area is now in the range of \$50 million a year. Biomedical

research is of two main types, both of which are essential to further progress:

1. Reproductive biology covers the anatomy and physiology of reproduction. This work, which is largely fundamental and not applied in nature, is often unrelated to population control objectives. It nevertheless provides the basic knowledge of the full chain of events involved in reproduction. Such knowledge is far from complete.

2. Contraceptive development is goal-oriented applied research. Even though not all links in the reproduction chain are delineated, many areas are sufficiently well understood to support present contraceptive techniques and to suggest some promising new leads. These can be translated into contraceptive products if they meet standards of safety and acceptability. They point to the following future possibilities:

a) **Hormonal method:** a monthly pill, a postovulatory progestin that induces menses; a weekly pill which affects the lining of the uterus and prevents ovum implantation; a precoital pill which acts by causing thickening of cervical mucus which acts as a barrier to sperm passage; a long-acting injection which provides a more satisfactory performance than reported with medroxy progesterin acetate and related hormones; and a long-acting skin capsule, a progestin implant which causes infertility for up to one year.

b) **Mechanical method:** a high-performance, low-side-effects IUD—e.g., the copper T intrauterine device.

c) **Postconceptive method:** Prostaglandins—a vaginal insert which causes termination of pregnancy.

A number of these developments are in various stages of trial and testing. They include:

- **Progestagen Skin Implants.** Delivering progestagens to the system on a long term basis by under-skin implant offers promise. A method now in the intermediate stage of development requires the injection of capsules containing progestagen under the skin of the arm or hip. A quick, painless outpatient procedure, this method offers promise because it is economical and convenient, requiring implantation only once a year.

- **The Copper T IUD.** This is a T-shaped IUD with a strand of fine copper wound around the stem; in trials it seems not to have some of the main disadvantages of other IUDs. Its users have been reported to be free of bleeding and cramps. Because of its shape it is not expelled and the reported pregnancy rate is close to zero. The exact mechanism of copper's effect on the endometrium to prevent pregnancy is not known. Like all IUDs, the "T" does not interfere with either ovulation or menstruation.

- **Prostaglandins.** A new type of contraceptive is provided by prostaglandins, a body chemical of many uses. One of its characteristics is that it acts as a chemical abortifacient; it is therefore a postconceptive method. Its action in producing abortion has been amply demonstrated, but it seems on the basis of present information that side effects and toxicity still need to be regulated. Prostaglandins offer the best promise when used intravaginally. One advantage of this or a similar contraceptive is that it can be used after a pregnancy has occurred, when motivation is high. It also requires no regulation of sex activity and greatly reduces the need for education.

Medical Supervision and Assistance Required

Contraceptive methods differ in the extent to which they need to be supervised and carried out by medically trained personnel. Some methods (e.g., the condom, foams, jellies, etc.) require no medical supervision and can be made available in outlets unconnected with health services. Other methods, e.g., abortions and sterilizations, require highly trained, highly specialized medical personnel working under hospital operating room conditions.

Between these extremes are methods for which some degree of supervision and assistance by medical or paramedical personnel (nurses, midwives, health visitors, etc.) is necessary, and contraceptive delivery normally relies heavily on the general health system. These conditions apply to both “the pill” and IUDs; well trained personnel are required to examine for possible contraindications, and to insert the IUDs. There is room for judgment, however, as to the degree of medical supervision and assistance required at delivery points in the system. This is an important point that affects the planning and staffing of a program’s various delivery systems and the design of training courses for the different categories of staff involved in the provision of services.

EVALUATION OF FAMILY PLANNING PROGRAMS

As with any action program designed to produce attitude changes and influence behavior in population groups, the evaluation of family planning programs is based on the following general principles: a) Definition of program objectives; b) Selection of appropriate criteria to judge achievement; c) Decision on the design of evaluation; d) Collection and analysis of data; and e) Interpretation of findings for use by program administrators.

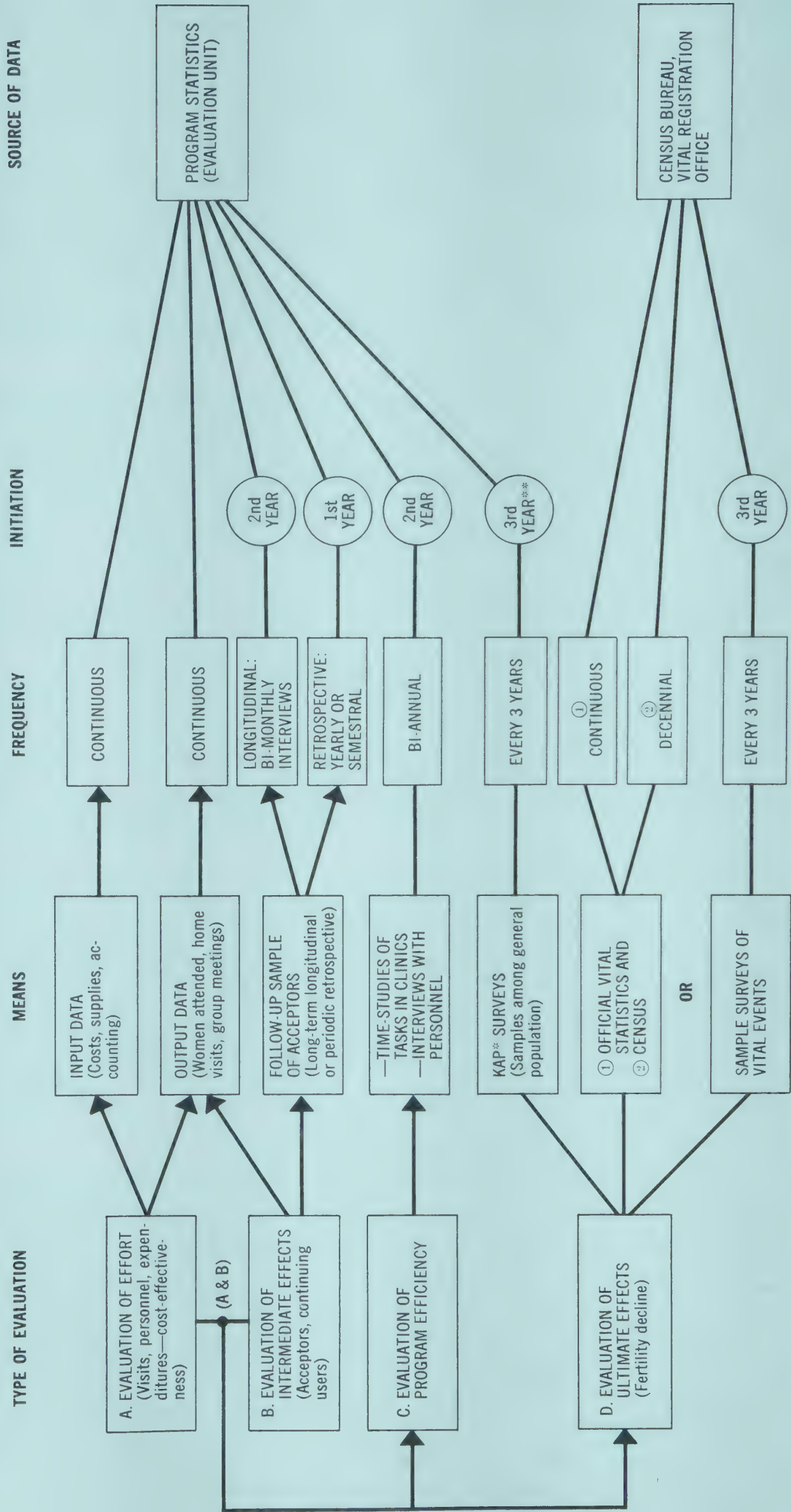
The frame for the evaluation process is built upon the definition of a hierarchy of objectives. It comprises the ultimate objective, fertility reduction, and an array of descending and branching subsidiary objectives. The ultimate success of the program will depend on the extent to which the established targets are met and the validity of assumptions on which the various goals are based.

In the evaluative process of a family planning program, the following progression may be identified: a) Evaluation of program efforts or inputs (personnel-years, visits, clinics, costs, etc.); b) Evaluation of intermediate results (number of new acceptors, continuing users, etc.); c) Evaluation of program efficiency (relation of intermediate results to various physical or financial inputs; this stage corresponds to an evaluation of process); and d) Evaluation of effect on the ultimate goal, fertility decline.

Independent of the administrative arrangements under which an evaluation system operates, both continuous and periodic data collection will be required to develop quantitative measures and indicators of program achievement. The system should provide a steady flow of information for judgment of program performance, for stimulating new approaches tending towards program improvement, and for testing procedures, on a demonstration basis, before adopting them as standard for the whole program.

In order to carry out the different stages of evaluation, a system combining continuous data collection with periodic sample surveys will be required. This Annex describes the technical means to accomplish evaluation at all indicated levels. The accompanying diagram relates the various levels with the data collection mechanisms and gives an indication of time frequency and phasing of activities. A clear understanding of the functions of all the means of measurement indicated in the diagram will help considerably in designing and administering family planning programs in which decisions will be based on concrete knowledge about what is more efficient in rela-

Components of Evaluation of a Family Planning Program



*SURVEYS OF KNOWLEDGE, ATTITUDE AND PRACTICE CONCERNING CONTRACEPTIVES AND FERTILITY CONTROL.
**ASSUMING THAT A SURVEY WAS CARRIED OUT PRIOR TO INITIATION OF FAMILY PLANNING PROGRAM.

tion to the intermediate and ultimate goals of program acceptance and fertility decline.

Evaluation of Program Effort

Statistics maintained on clinic operation, number of visits, sessions, personnel time, materials and expenditures are measures of the effort made and should be considered as guides for the administrator in terms of cost controls, methods of storing and distributing contraceptives to clinics, personnel requirements, etc. Also, to an extent, data on the numbers of acceptors and their characteristics give a measure of the effort by field personnel to encourage women to attend clinics and adopt a contraceptive method.

Record keeping of new acceptors and revisits is necessary for establishing a follow-up system through which women may be reminded of their next appointments and home visits may be scheduled by field workers for women failing to keep appointments. A simple form to keep records of new and returning patients should be designed by the evaluation unit. A summary sheet of daily activities, keeping new and returning patients separate, will be needed as a basis for preparing a monthly report to the district or state headquarters.

The monthly reports are usually designed to be filled with pre-coded information for punching. Tabulations may then be produced at the central level with mechanical equipment or computer. Prompt distribution of monthly reports (within three weeks) as feedback to districts and clinics as well as summaries for the whole country are important for effective use of the information. Detailed cross-tabulations at the state and national levels could be produced annually. A system along these lines, once in operation, will provide current information about program performance and will also serve to establish a follow-up of patients. In addition, it will be used as a frame for the periodic sample surveys referred to below.

Until now, in the absence of better information, data on new acceptors have been generally used as a main indicator of "program success." It is recognized, however, that the important fact in a family planning program is not so much the acceptance of a method of contraception by a woman, but continued use, or retention in the case of the IUD.

Evaluation of Intermediate Effect

The extent to which women in reproductive ages accept contraception, and the rate at which they continue to practice it, may be determined from sample groups of acceptors, followed up in longi-

tudinal studies for relatively long periods, or from periodic retrospective surveys among acceptors. An estimate of the relationship between extent of contraceptive use and pregnancy prevention may be derived from these follow-up studies of acceptors by matching, i.e., by including in the study a control group of other women outside the program, with socio-demographic characteristics similar to those of women in the family planning program. Controls in this case, as in medical investigations, pose sensitive problems to be tackled by the evaluator with great caution.

The relationship between contraceptive practice and pregnancy prevention may also be assessed by comparing subsequent fertility of women in the program with an estimate of their “expected” fertility performance in the absence of contraceptive practice. Follow-up sample surveys among clinic acceptors will provide a measure of use-effectiveness of contraceptives; also, they will allow calculation of rates of discontinuance, determination of reasons for discontinuance and explanations for failures, and will help in correcting procedures and redirecting efforts for recruiting acceptors.

A system of evaluation must be set up and conducted under the same principles ruling scientific research, with constant awareness that results are to be utilized by the administrator to increase efficiency in relation to the established goals. The ability of the administrator to make purposeful use of these results is a key issue in the whole exercise of evaluation.

Evaluation of Program Efficiency

In the diagram of components of evaluation, the assessment of program efficiency is a separate activity ascribed to the evaluation unit. Its objective is to obtain a measure of the adequacy of the services. The proposed mechanism for this measurement is a special study to be made every two years to determine effectiveness of the family planning personnel in meeting the needs of the public and performing the intended tasks. Time studies in which skillful individuals observe portions of tasks for short periods of time and take note of all movements and details of service performance, are appropriate for this assessment.

As in the case of follow-up surveys, rules of scientific research apply to these studies. They should be based on a sampling scheme of clinics, personnel, and time intervals during the day, and should strive for representativeness and minimum bias. A time study of this type may require as much as a year for design, development of methodology, actual surveying and analysis. In the last few years, however, some universities in the United States have carried out studies of this

type in several developing countries, and a methodology has been developed which, with proper alterations for particular situations, may allow replication of the study in approximately three months. Thus, it might be feasible to perform one time study every two years as part of the general evaluation system.

In a large-scale family planning program, there is pressure to operate within a limited budget. Efficiency of the program, i.e., getting the job done well at the most reasonable cost, is important. Cost-effectiveness is measured by the ratio of input to output; inputs are given in monetary units and outputs in units of work in the program, e.g., number of acceptors for the clinics, number of visits made for the field workers, number of meetings held, number of persons attending meetings, etc. In order to allow for analysis and comparison of costs per unit, it is helpful if activities are classified in broad groups for accounting purposes. For instance, the groups may be: a) Administration; b) Clinic and medical services; c) Field work and community organization work; d) Public information and mass communication; e) Training of personnel; and f) Research and evaluation.

Some of the major categories above could be subdivided into a few sub-categories for principal types of expenditures, e.g., personnel (medical, non-medical), maintenance of buildings and equipment, contraceptive and medical supplies, and other supplies. This information from the accounting system would give the nominator for calculation of the cost-effectiveness ratio, using as denominator data on number of "units" produced by the major activities of the program. Comparisons of cost-effectiveness ratios between clinics, districts (for field work), and training centers, would provide evidence to pinpoint operational problems. These data would also serve to calculate overall cost-effectiveness ratios for the program.

Evaluation of the Ultimate Effect—Fertility Decline

Information about existing fertility levels and patterns in a country are obtained from the following sources: a) Censuses; b) Registered vital statistics; c) Sample surveys of vital events; and d) Sample surveys on knowledge, attitude and practice concerning contraceptives and fertility aspirations.

Censuses provide valuable material for the calculation of fertility measures, through the application of special demographic techniques. In many developing countries with deficient vital registration systems, censuses taken around 1970 will be the main source of information for establishing changes in fertility and mortality that have taken place during the decade 1960-70. Detailed census tabulations needed for these analyses are delayed in many countries, however,

due to problems of enumeration, requiring manual verification of questionnaires, and to scarcity of computer programming ability.

In many developing countries, the registration of vital statistics is incomplete or lacking entirely. In recent years, efforts have been made to remedy this deficiency by carrying out sample surveys which are also used as a basis for establishing or improving permanent registration. Detailed tabulations on births by age, sex, parity, and other socio-economic characteristics are important to calculate refined measures of fertility, such as age-specific fertility rates, gross and net reproduction rates, total fertility rates, etc.

Very few countries have good registration systems, however, or timely processing of data. Sample surveys for registration of vital events are the most expedient solution to this problem, but their design and implementation are costly and time consuming operations requiring trained personnel. Recent surveys carried out in developing countries with U.N. assistance are producing estimates of vital rates on the basis of area and household representative sampling and periodic interviews (one every three or four months) to register all vital events in the household during the interval. Usually, each household in the sample is interviewed four or five times during a period of 12 to 15 months.

Knowledge, Attitude, and Practice (KAP) Surveys

In the last few years, several countries have conducted special surveys on the knowledge, attitudes, and practices of people concerning reproduction and contraception (KAP surveys). These surveys play an important role within the system of evaluation of a national family planning program. Data on the fertility, attitudes and contraceptive practices of the population in general are essential as measures of control and comparison with the results obtained from studies of acceptors. Therefore, KAP surveys should normally be an integral part of any evaluation system.

Main groups of variables to investigate, common to KAP surveys and follow-up studies of acceptors of family planning programs, have been set up by an international committee of experts convened by the International Union for Scientific Study of Population and the United Nations¹ (1966-70). These variables may be grouped as follows:

- Data on fertility (complete marriage and reproductive histories).
- Measures of the "intermediate variables" (according to the analytic framework developed by K. Davis and J. Blake), that is, those through which any social variables should work to affect fertility.

¹United Nations, *Variables and Questionnaire for Comparative Fertility Surveys*, Department of Economic and Social Affairs, Population Studies No. 45, New York 1970.

These include, for instance, age at marriage (or at first sexual union), periods of separation, use of contraception, fecundity and its impairments, and natural or induced abortions.

- The social norms about these intermediate variables, as well as the norms about family size and child spacing.
- The elements of the social and economic organization which affect the norms, the intermediate variables and fertility itself (education, rural-urban background, women's economic activity, husbands' occupation, religion, ethnic language, extended versus nuclear family, income, etc.).

Fertility Indicators

Several indicators of population dynamics are derived from the data of censuses, vital statistics, and sample surveys of vital events. They serve to define the fertility of a population in terms of magnitude, trends and differentials. The most common and elementary measure of fertility is the crude birth rate; it represents the number of live births in a population group during a given year divided by the population at mid-year (person-years of exposure). More refined measures of fertility are obtained by restricting the denominator of the rates to the population actually at risk (number of women in reproductive ages, or, even more specifically, women married or in consensual unions).

The general fertility rate (number of live births over female population 15 to 44 or 49 years) represents an improvement over the birth rate as a measure of fertility. However, since the frequency of child-birth varies markedly with the age of women, age-specific fertility rates describe even better the fertility pattern of a population. A more synthetic measure, based on the age-specific fertility rates, is the total fertility rate, which results from adding the former and multiplying the results by the age interval used (usually five years). It represents the average number of children born to each woman during her reproductive life. The gross reproduction rate (GRR) is constructed in the same way as the total fertility rate, but is restricted to female births, thus being an estimate of the average number of daughters born to women during the whole reproductive period. The net reproduction rate is based on the same principle as the GRR, but it takes into account the mortality of the female population.

The indicators mentioned above are some of the conventional measures of the level of fertility. They permit making comparisons between geographic areas as well as observation of changes through time. For the latter analysis, a series of observations at successive dates is needed. Interpretation of fertility changes through time is

complicated by the fact that in response to especial conditioning, couples sometimes advance or delay their bearing of children. This may cause sharp movements of yearly rates, with little or no effect on the total size of family that they eventually attain. In other words, a change in annual rates may not be permanent, but reflect a shift in the scheduling of births. This is particularly so in societies where contraception is practiced to a large extent.

Analysis of the fertility of cohorts of women (age-specific birth rates derived from an actual group of women completing child-bearing) is being used increasingly in fertility studies of developed countries with good statistical information, dating back many years. For the less developed countries, however, data on reproductive histories are rare and comparisons through time will have to be based on periodic measures for a long time to come. Awareness of the usefulness of cohort analysis, however, is important to stress improvement of registration of vital events, anticipating the need for more complex measures of fertility as contraception becomes an accepted practice.

Impact of the Family Planning Program on Fertility

Reference has been made to the measurement of program effect on the fertility of women attending clinics. A separate problem is the measurement of program impact on the level of fertility of the population in general. That is, if fertility indicators show a declining trend, the problem consists of explaining the fall in fertility in terms of several interrelated factors. A multivariate analysis with fertility as the dependent variable and program activity as one of the independent variables is appropriate in this case. Such analysis is, of course, conditioned to the availability of data. For this evaluation, a thorough understanding of the determinants of fertility is necessary in order to select pertinent variables, with explanatory power. One possibility would be to use geographical divisions in a country as units of analysis, with and without family planning programs or with measurable accomplishments in family planning. Information on vital events would also be necessary for each unit.

Again, the problem of census data availability, with detailed tabulations by socio-economic characteristics of the population, is evident for evaluation purposes. For further refinement, a multivariate analysis could be performed, using as units of analysis individual couples in and out of the program. The sources of data for this analysis could be a KAP survey in the general population and a follow-up survey of clinic clients. A convenient way of dealing with the nominal character of client status and other unquantifiable variables is the use of dummy

variables, applied often in sociological studies. Regression analysis offers the technical tool to judge the significance of the contribution of several variables (including clinic attendance) to the fertility level.

Other less sophisticated ways to estimate what would have happened in the absence of a family planning program may be suggested. One possibility is to compare actual present fertility trends with those estimated before the family planning program began, or with trends projected on the basis of experience in the past 10 years (which in some developed countries are showing slight declines).

Still another way of assessing program impact would be to compare the socio-economic characteristics of clinic clients with those of the general population. Demographic evidence indicates that rising urbanization, literacy, income, etc., are major factors accounting for increasing contraception. Family planning programs have as their main objective promotion of the practice of contraception in spite of rural traditions, illiteracy, low income, etc. A test can be made by comparing groups practicing contraception outside and within the program. If clinic clients are disproportionately among the poorer classes, then the program can be considered effective in terms of goal achievement.

This brief outline of alternative ways of learning the effect of a family planning program on the fertility of a population suggests the mass of information and technical knowledge required of the evaluation unit. The first step in tackling the problem of evaluation is recognition of the magnitude of the task, and review of the possible means available.

Administrative Aspects

In most family planning programs now underway, evaluation is gradually being recognized as a necessity, but very few countries have adopted effective systems to provide it. In fact, due to the improvised fashion in which many of these programs originated (usually in the private sector, with undefined goals but great enthusiasm and faith in the cause of preventing pregnancies), the need for evaluation became clear only after governments began to develop national family planning programs, and investment of resources in these programs had to be justified in terms of results related to goals. Even then, the concept has often been limited, at least in part, to the evaluation of effort and of progress toward the intermediate goal (most often, number of acceptors only).

The main obstacles to establishing a system capable of covering all evaluational needs can be summarized:

- Insufficient understanding or recognition on the part of program

administrators and governing bodies of what evaluation really is, what is required to implement it, and how it can be used to improve the program.

- Unavailability or scarcity of professional expertise.
- Reluctance to accept technical assistance, which sometimes has been better designed to benefit the research programs of foreign institutions than to build effective evaluation systems for national purposes.
- Lack of adequate demographic information from censuses and vital statistics registration.

Once the obstacle of insufficient understanding is overcome and evaluation is accepted by administrators of the program as a useful tool for their activities, suitable expertise must be brought to bear on the problem. Often this can best be done by arranging for an expert team in demography, evaluation and social research to plan a system, with clear provisions in their contract concerning the national character of the operation. If foreign experts are employed, it will still be necessary to arrange for a team of national professionals, to be trained in all aspects of evaluation and research in an appropriate institution. Where foreign technical assistance is used, the national team should of course take over the operation after training, with an overlap of the two teams working together (for perhaps a year) before the total transfer of responsibilities. The whole process, from the planning stage to the complete take-over by the national team, may take as long as five years.

Given the availability of professional staff, a fundamental question is the place this evaluation team will occupy in the system. The following possibilities may be considered:

- An external body, outside the family planning program, partially devoted to family planning evaluation but also engaged in other activities (e.g., a department in a local university).
- The evaluation unit might be part of the national family planning organization, partially utilizing the same personnel and facilities.
- A separate unit, completely dedicated to evaluation and research in the field of population and family planning—a population center or institute, along the lines of the center in the Republic of China.

The first possibility should be treated with reservation. It implies a situation of ambiguity, in which evaluation might be diverted to other research or become too remote to the needs of administration. The second alternative runs the risk of not being objective enough to exert effective criticism from within. A separate unit appears to be the most workable and effective solution, provided that a strong link is established with administration of the program.

BILATERAL, MULTILATERAL AND PRIVATE AGENCIES

Twelve years ago, bilateral, multilateral and private organizations together devoted a total of about \$2.8 million to activities related to family planning; in 1971, the amount was about \$225 million.

The proportion of such resources going directly to developing countries has steadily increased, reaching about 70% in 1969, compared with some 45% three years before.

The most important components supported with external finance have been training and technical assistance (including salaries, allowances, etc., of foreign advisers); together, they accounted in 1969 for about 80% of the external resources allocated to family planning programs in developing countries.

A wide range of technical assistance is provided. It includes medical, paramedical, educational and administrative personnel directly involved in the distribution of family planning services; assistance in undertaking social, technical, psychological and demographic studies necessary to determine the kind of program which will be best accepted by the population; assistance in collecting information and in program evaluation; and assistance in training local personnel in all fields of family planning.

Another major component has been the supply of small equipment and contraceptives. This represented about 18% of the total in 1969.

The balance—about 2% in 1969—has been allocated to buildings, schools, vehicles and fixed equipment. In the same year, \$18 million was spent on bio-medical and social research and \$6 million in support of university training programs in the population and family planning fields in developed countries.

A summary of principal agencies and their programs follows:

Bilateral Programs

Canada. The government of Canada began assistance to family planning in developing countries after repeal, in 1969, of legislation against advertising or encouraging the use of contraceptives. In December 1970 the Government announced its first official support for family planning activities abroad. Assistance includes funding the work of international organizations (e.g. expanded medical research by UNFPA) and direct assistance in priority countries. Grants have been made to Barbados and Colombia, and to WHO for contraceptive research.

Denmark. Since the mid-1960s, the Danish Government has provided multilateral family planning assistance through a number of agencies, cooperated in family planning training courses, and supported contraceptive research. It has also provided bilateral assistance in family planning to India, Egypt, Thailand and Uganda.

A total of \$807,000 has been granted to the IPPF, both for special projects and for its general program. The UNFPA received \$400,000 during the 1967-71 period.

Family planning training courses are given for students from developing countries in collaboration with the Danish Family Planning Association. In 1968, Denmark made a grant of \$72,000 for activities of the Egyptian Family Planning Association and provided \$135,500 worth of raw materials for production of oral contraceptives.

Federal Republic of Germany. The Government allocated \$1.5 million to the United Nations Fund for Population Activities in 1970 and 1971. Other financial support has gone to the United Nations Development Programme, which was granted \$250,000 in 1969, and to the population group in the OECD Development Center. The Government supported a multi-functional training and research center in Tunis in 1971.

Japan. The Japanese Government, whose assistance to family planning in developing countries began only recently, expanded its efforts considerably in 1969. A grant of \$100,000 was made to the International Planned Parenthood Federation in 1969 and 1970; in 1971, the grant was increased to \$500,000. In 1971 Japan pledged \$2 million to the UNFPA. In October 1970, it sent a family planning mission to Indonesia. Following the mission's recommendations, the Government began receiving Indonesian trainees and sending advisers and materials to that country.

The Family Planning Federation of Japan, Inc., established in April 1968, provides contraceptive materials, equipment and other commodities to the Republic of China, Indonesia, Republic of Korea and Nepal.

Since 1967, seminars on family planning have been held for doctors, nurses and government officials from southeast Asian countries. They have been conducted by the Government's Overseas Technical Cooperation Agency and the Family Planning Federation.

The Netherlands. The Government of the Netherlands has contributed to the United Nations Fund for Population Activities and is providing about \$1.7 million to assist family planning activities in Indonesia, Kenya, Pakistan, and Tunisia.

In Pakistan, the Netherlands supports research to gather data on motivation of the rural population towards family planning and to

help implement Pakistan's family planning program. Under a three year project begun in 1968, five Netherlands nationals did research in selected villages.

A 1968-73 project in Kenya includes training of local personnel in contraceptive uses, and clinical research on the applicability of various family planning techniques and the causes and treatment of sterility. A two year project including clinical research and training of medical personnel in Tunisia will help to implement the Tunisian Government's family planning program. Two grants have been made to Indonesia; one was for the National Training Center, the other for the National Family Planning Institute and two Indonesian universities for social and clinical research.

Norway has given assistance to family planning activities since 1964. Since 1970, its aim has been to allocate approximately 10% of total aid appropriations to such activities in developing countries, divided about evenly between multilateral and bilateral programs. Bilateral aid, primarily financial, will go mainly to Norway's priority countries that request assistance.

In 1971 Norway provided \$1.5 million to the UNFPA. It has also contributed to the IPPF and UNICEF for family planning purposes. Under the bilateral program, \$1.1 million was granted to the post-partum family planning program in India. Norway also contributed clinical equipment to Kenya for the establishment of 50 family planning units in health centers.

Sweden. Family planning has been assigned the highest priority in Sweden's development aid program. Aid is extended through the Swedish International Development Authority (SIDA), and has grown from a single project in Ceylon in 1958 to assistance in materials, finance, and personnel to numerous developing countries. Disbursements in 1969-70 amounted to approximately \$5.3 million. They rose to about \$6.4 million in 1970-71, and were expected to total some \$11 million in 1971-72. The share of Sweden's bilateral aid for family planning has increased from a few percentage points in the early 1960s to about 10% today.

SIDA now furnishes supplies and equipment to some 14 countries. In three of these (Ceylon, Kenya and Tunisia) it also provides expert personnel for government programs. SIDA also has a special arrangement permitting governments and organizations to buy contraceptives at reduced prices, made possible by volume purchases. The Government provides substantial allocations to the International Planned Parenthood Federation and various United Nations organizations. Assistance has also been given to WHO for research in human reproduction.

The United Kingdom. The United Kingdom has recently increased its aid to population programs through both multilateral and bilateral channels. The allocation for 1971 was \$4 million.

Grants were made to the United Nations Fund for Population Activities and to the International Planned Parenthood Federation. At the meeting of the Consortium on aid to India in May 1970, the United Kingdom pledged an interest-free loan of \$2.4 million for local costs of the Indian family planning program. Technical assistance is being given to some 10 or 12 countries.

A Population Bureau was set up in 1968 by the Ministry of Overseas Development. The Bureau encourages training and research and helps to provide operational and advisory personnel for overseas programs. A fertility research unit was established at the London School of Hygiene and Tropical Medicine in January 1970. A graduate course in medical demography, at the same school, commenced in September 1970. Both programs receive assistance from the Government.

United States. The largest budget for population assistance is that of the United States, operating chiefly through its Agency for International Development (AID). AID's budget increased from \$50 million in 1969 to \$75 million in 1970 and \$100 million in 1971, compared with \$4 million in 1966 and 1967.

AID has supported bilateral programs in 33 countries and helped finance activities in many others through organizations such as the International Planned Parenthood Federation (IPPF), the Pathfinder Fund, the Population Council and the United Nations. Assistance covers all major disciplines concerned—information, education and communication, demography, social research, and research in fertility control methods. The Agency assists in manpower development, including leadership and specialized technical training in evaluation and analysis. It also promotes institutional development. In 1971, AID provided contraceptives for family planning programs in more than 70 countries and made available supplies and equipment to a number of institutions.

In addition, research on population and family planning in developing countries is carried out in the U.S. Department of Health, Education and Welfare, largely by agencies under the Public Health Service. Some 100 Peace Corps volunteers have worked in population programs overseas.

Multilateral Programs

The Food and Agriculture Organization of the United Nations (FAO) is becoming involved in the population field in two areas:

policy-oriented research into the implications of population trends for agricultural development (food consumption and nutrition and their effects on fertility and mortality), and integration of family planning into home economics education programs.

The International Labour Organization (ILO) has a mandate to promote information and education activities on population and family planning and to conduct policy-oriented research on the demographic aspects of social policy in such fields as employment promotion, social security, and enterprise-level medical services in family planning.

The United Nations. On the basis of resolutions adopted over the last several years, all major United Nations agencies have authority to undertake action programs in population and family planning.

In 1969 several of these agencies took the first steps to develop and pursue operational programs, with financial support from the United Nations Fund for Population Activities (UNFPA). This Fund was established by the Secretary-General in 1967 to finance an expanded United Nations program in population and family planning. During 1969, the Secretary-General turned over management of the UNFPA to the Administrator of the United Nations Development Program (UNDP), the central technical and development assistance agency for the United Nations.

By the end of 1969, more than \$5 million in contributions had been pledged to the UNFPA, of which \$4 million was provided by the United States. Other contributors were Denmark, Finland, the Netherlands, Norway, Pakistan, Sweden, Trinidad and Tobago, and the United Kingdom. In 1970 the Fund received pledges of \$15.4 million, and in 1971 \$28 million. By the end of 1971, about 60% of these funds had been received for disbursements. Most were obligated for projects involving support for demographic training activities, research on demographic and population questions, advisory missions and technical services to member countries, national program support for non-conventional equipment and supplies, information and documentation, and infrastructure costs within the United Nations system.

The Population Division, within the United Nations Secretariat, continues its program of demographic research and projections, technical information services, and support for conferences and technical meetings, funded from the regular budget of the United Nations. In addition, the Population Division executes for the UNFPA, as do other elements of the United Nations system, the provision of technical assistance to countries in areas within its competence.

United Nations Educational, Scientific and Cultural Organization (Unesco). Population programs are a new area for Unesco, and the

work program is developing rapidly. Unesco's population and family planning activities increased from less than \$500,000 worth of UNFPA-financed projects in 1970 to an estimated \$3.5 million in 1972.

The Organization's mandate covers the development of curricula and teaching materials, teacher training, the use of communications and related training, and research in population-related education, motivation, evaluation, etc. Unesco has sent advisory missions to a number of countries, provided consultants and advisors for national education and communications programs, conducted regional meetings and training courses and, through its regional office in Bangkok, produced sample population education materials. Proposed projects include seminars and workshops and an expanded program of research, including the development of simulation studies on demographic growth and educational opportunity.

The United Nations Children's Fund (UNICEF) has provided assistance for family planning since 1967, as part of its maternal and child health programs. Its contribution has been in the form of vehicles, equipment and supplies, salaries for teaching staffs, and stipends for trainees. Under an Executive Board decision in 1970, UNICEF is also able to furnish contraceptive supplies to countries on request.

The World Health Organization (WHO) has a key role in carrying out an effective United Nations family planning effort. WHO has a mandate to work in the health aspects of human reproduction, family planning, and population dynamics, and is expected to assist countries in the development of family planning activities within the context of health services.

Private Agencies

The Ford Foundation. The Ford Foundation has contributed substantial funding for population work. Since 1952, it has committed about \$147 million for this purpose, and has been an important force in three areas concerned with problems of population: research and training in reproductive biology, establishment and expansion of university population study centers in the United States, and assistance to family planning programs in developing countries.

Major emphasis has been on reproductive biology, with some \$80 million in grants going primarily for fundamental research and training programs in 93 institutions around the world. Grants have been made to a dozen university centers focusing on population problems. While two thirds of the Ford Foundation's population expenditures have gone to American institutions, their activities in the field are mainly directed toward population problems in developing countries.

Since the mid-1960s, resources devoted to population work in developing countries have grown significantly. The Ford Foundation has financed family planning work in 26 developing countries. In Asia and Africa it is assisting family planning action programs as well as training and research. In Latin America, emphasis is placed on the study of population problems and reproductive biology.

The International Planned Parenthood Federation (IPPF). The IPPF assists the formation and effective operation of family planning associations and institutional affiliates throughout the world. It encourages and supports the training of medical and paramedical workers, sponsors workshops and seminars, and promotes and organizes international and regional meetings and conferences. The Federation also stimulates scientific research in the fields of biology, demography, sociology, methods of contraception, fertility and subfertility, sex education, and marriage counseling.

Established in 1952, IPPF is an association of autonomous national family planning associations. One non-governmental family planning association in each country is eligible for full membership, provided it is a national organization. In 1971 there were 79 members, including associate members and two affiliates. Information and assistance have also been given to non-member associations. The IPPF has six regional offices, and representatives for Africa in Nairobi and Accra.

IPPF is financed largely by foundations, individuals and grants by governments. It has also received assistance from the UNFPA. Indicative of the growth of the Federation in recent years was the increase in its annual budget from \$325,000 in 1962 to nearly \$20 million in 1971 and its estimated program of \$25 million in 1972.

The Population Council. The Council was established in 1952 and is financed primarily by the Rockefeller and Ford Foundations. It promotes research, training and technical assistance in the social and bio-medical sciences, and serves as a center for the collection and exchange of information on significant ideas and developments in the field. Its activities include an extensive publication program.

The Council initially confined its activities chiefly to fellowships and small demographic and bio-medical research grants. In the early 1960s, however, it began to give technical assistance to family planning and population projects in developing countries. Its budget in 1970 totaled \$17.2 million. It had a staff of about 230, of whom 30 served in 18 foreign countries. Through its Technical Assistance Division, the Council provides support to family planning programs in 17 countries. It also seeks to evaluate the effectiveness of programs.

The Council's Demographic Division has assisted the United Nations Demographic Centers in Bombay, Cairo and Santiago, and

national centers in 15 countries. Grants have been made to numerous university departments and study centers in developing countries. The Demographic Division also conducts research on fertility, estimation of rates of population growth, population policy, and related topics.

The Bio-Medical Division has focused much of its resources on specific research leads in various methods of contraception. In 1967 it began a project to establish fertility regulation by continuous progestin therapy. The progestin—in this instance megestrol acetate—is being field-tested in 10 countries. Research on a number of other contraceptive leads is being done by an international panel of experts in six countries. Basic research on reproductive biology and other aspects of fertility regulation is also being conducted.

The Council started its International Postpartum Family Planning Program in 1966 in 25 hospitals in 14 nations. The program has grown to include 150 hospitals and clinics operating in 14 countries in Asia, Africa, Latin America and the Middle East.

The Postpartum Program is an international demonstration effort to provide family planning information and services immediately after childbirth to urban women of low socio-economic status, in settings where delivery is institutionalized in public hospitals and clinics. A world-wide follow-up survey has been completed.

The Rockefeller Foundation. Although the Rockefeller Foundation gave support to bio-medical research in fertility control in the early 1930s, it was not until the late 1950s and early 1960s that the Foundation made major commitments to help solve population problems. Since 1963 it has provided more than \$45 million, including more than \$15 million in 1970.

The Rockefeller Foundation concentrates increasingly on the interaction of social, medical and biological sciences. It finances research, training and experimental programs in a broad range of fields relevant to population and, like the Ford Foundation, is making a major effort to stimulate basic research in reproductive biology.

At the University of North Carolina, a grant was made to finance research on applying techniques of modern cellular and molecular biology to problems of fertility control. A new building to house the Harvard Laboratory of Human Reproduction and Reproductive Biology was made possible by a Rockefeller Foundation grant of \$2 million to equip the Laboratory and provide staff over the next 10 years. Grants were made to Tulane, California, Columbia and Georgetown Universities. The Foundation has also supported research at the London School of Economics and in universities in Chile, Colombia, Indonesia, Mexico, Thailand and Turkey.

RESEARCH

Research in population is as varied as the disciplines concerned. It can be classified into four groups:

- **Demographic research.** Research related to the basic demographic variables—fertility, mortality, migration, and implications for the size, structure, and rate of growth of populations. A growing but specialized aspect of this research concerns the demographic assessment of the effects of fertility control programs.

- **Economic research.** Economic implications of population trends, including the economic effects of programs, and the economic analysis of programs (cost-effectiveness, for example), etc.

- **Bio-medical research.** This covers the entire field of contraceptive technology and reproductive biology, including related clinical trials. It involves basic physiological research, research on products and agents and their action, and also applied field trials for clinical testing, evaluation of side effects, etc.

- **Operational research.** This involves research directed to operational problems in selected disciplines, e.g., management, evaluation, communications, educational methods, and media.

Research in all these areas has increased as interest in population matters has grown and more money has become available. The spectrum of interests is very wide, not only in its interdisciplinary scope, but also in its range from purely theoretical topics to narrowly focused projects designed to solve day-to-day applied problems. Much of the planned and ongoing research is not directly relevant to operational needs. However, in a rapidly expanding field where research has been neglected in the past, it is not always possible to assess the longer term significance of research topics that may appear, in the short run, to be of no direct operational relevance. There is a clear need to expand the boundaries of knowledge about population matters in all directions, while recognizing that only a limited range of topics is likely to fall within the immediate interests of the Bank.

It is useful to distinguish three kinds of research interests for the Bank. There is a wide range of population matters which do not fall within the competence of the Bank, and are not a direct concern of day-to-day operations, but in which the Bank has an interest in seeing that knowledge and understanding are expanded through research. This can be done by making the Bank's interests known and encouraging other, more appropriate, institutions to plan and finance the research. The most important group of subjects in this category covers the fields of basic research in human biology and reproduction, con-

traceptive development, and other medical and health topics. It will be necessary to follow the progress of this kind of research and to consider, at an appropriate time, whether the Bank can make a contribution in a coordinating role. Initiatives being taken by WHO and the Population Council through its International Committee on Contraceptive Research, in addition to those of the industry, represent an expanded effort in this field.

Second, there are research topics that the Bank has an interest in pursuing but where the work cannot be done easily within the Bank, either because of staff commitments or because the work is not feasible with facilities available. As in other areas of activity, such research can be contracted out under staff supervision. In this respect some aspects of population research would be no different, in principle, from other areas in which the Bank has undertaken work through consultancy arrangements. An additional reason for such arrangements, however, may be the need to encourage the development of research institutions and capacity in the developing countries. This may be as important in the population field as obtaining actual research results.

The third area of research activity covers those studies which can and should be done by Bank staff. This group is not always sharply distinguished from the kind of topic that might be handled on a consultancy basis. It will normally be identified by the criteria that it can be best pursued within the context of project, sector and country economic work, and will focus on problems of operational interest to the Bank.

The objective of most Bank-sponsored research will be to provide information which will ultimately lead to the improvement of Bank operations. This objective suggests that research projects which are to be useful in this sense must be linked closely to population programs and relate to program needs, including the generation of appropriate data for this purpose. It will often be the case that the most effective research will be done through local talent, which is likely to be most sensitive to local needs and priorities. This would in no way preclude the use of expatriate assistance in the planning and undertaking of many aspects of research. The essential need is for a partnership rather than a paternalistic relationship. Experience with family planning programs so far strongly suggests that a minimum of three to five years may be necessary before research can lead to meaningful conclusions. The planning, collection and analysis of the data required set the minimum period before research results can be used to improve program performance and measure results.

One of the Bank's main objects in the field of research will be to build into projects it finances a strong management evaluation component, linked in the most appropriate way to program administration. The usefulness of data generated in such projects will be enhanced if it is collected in such a way as to make possible meaningful comparative studies. This is particularly important if progress is to be made in understanding the relationship between costs and results of family planning services in terms of the number of people served and possible effects in reducing fertility. This information does not now exist on any basis which makes possible sound generalizations about the scale of expenditures needed to produce a given reduction in fertility.

Part of the research program of the Bank, therefore, both internal and as contracted through consultancy arrangements, will focus on key aspects of the management of family planning programs. In particular, it is proposed to study the methodological aspects of family planning programs including the cost-effectiveness, evaluation and cost-benefit aspects. Of equal importance is the need to study the cost patterns arising from different variations in family planning programs, including the resultant budgetary implications of program development. A third area of research of interest for program operation covers the role of the commercial sector in the provision of family planning services.

These topics are those most closely related to the operational needs of the Bank, insofar as lending for family planning is concerned. However, there are other areas of population research equally relevant for operational purposes but not directly connected with project activity. These include studies to support general economic analysis of the development prospects of member countries, and related sector analysis. They include the demographic and macro-economic aspects of development.

In choosing topics to be pursued through consultancy arrangements, special attention will be paid to proposals for collaborative research with institutions in member countries. An important role in country project development will be to support related social research through national institutions; this could range from the provision of positions, support to programs, and establishment of centers for this type of supportive research. The objective of these proposals is to provide support for strengthening research capabilities in the developing countries and, at the same time, ensure that research of importance to both the country and the Bank is carried out by local talent.



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